

TABLE 2-1 (cont'd)

SURFACE WATER BODIES AND BENEFICIAL USES

	SURFACE WATER BODIES	HYDRO UNIT NUMBER	AGRICUL -TURE		INDUSTRY		RECREATION		FRESH- WATER HABITAT (2)		MIGRA- TION	SPAW- NING		WILD NAV
			MUN	AGR	PR OC	IND	PO W	REC-1		REC-2		WARM	COLD	
								IRRIGATION	STOCK WATERING		PROCESS			SERVICE SUPPLY
43	BEAR RIVER	515.1	E	E	E			E	E	E	P	P	P	E
	AMERICAN RIVER													
44	NORTH FORK, SOURCE TO FOLSOM LAKE	514.5	E	E				E	E	E	P	E	E	E
45	MIDDLE FORK, SOURCE TO FOLSOM LAKE	514.4	E	E	E			E	E	E	P	E	E	E
46	DESOLATION VALLEY LAKES	514.4						E	E	E	E		E	E
	SOUTH FORK													
48	SOURCE TO PLACERVILLE	514.3	E					E	E	E	P	E	E	E
49	PLACERVILLE TO FOLSOM LAKE	514.32	E	E				E	E	E	E			E
50	FOLSOM LAKE	514.23	E	E			P	E	E	E	E	E		E
51	FOLSOM DAM TO SACRAMENTO RIVER	519.21	E	E			E	E	E	E	E	E	E	E
52	YOLO BYPASS (7)	510.		E	E				E	E	E	E	E	E
	CACHE CREEK													
53	CLEAR LAKE (a)	513.52	E	E	E				E		E	E	E	E
54	CLEAR LAKE TO YOLO BYPASS (d)	511/ 513	E	E	E	E	E		E	E	P	E	E	E
	PUTAH CREEK													
55	LAKE BERRYESSA	512.21	E	E	E			P	E	E	E	E		E
56	LAKE BERRYESSA TO YOLO BYPASS	510/ 511	E	E	E				E	E	P	E	E	E

Notes are located after the table.

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TABLE 2-1 (cont'd)

SURFACE WATER BODIES AND BENEFICIAL USES

	SURFACE WATER BODIES	HYDRO UNIT NUMBER		AGRICUL -TURE	INDUSTRY	RECREATION	FRESH- WATER HABITAT (2)	MIGRA- TION	SPA W- NING	
				AGR	PR OC	IND	PO W	REC-1	REC- 2	
			MUN					WARM COLD	MIGR	SPWN
				IRRIGATION STOCK WATERING	PROCESS SERVICE SUPPLY POWER	CANOEING AND RAFTING (1) OTHER NONCONTACT	WARM COLD	WARM (3) COLD (4)	WARM (3) COLD (4)	WILDLIFE HABITAT NAVIGATION
	OTHER LAKES AND RESERVOIRS IN SACRAMENTO R. BASIN 5A (5)		E	E E	E	E	E	E		E
	COSUMNES RIVER									
57	SOURCES TO NASHVILLE RESERVOIR (PROPOSED)	532.	E	E		E		E		E
58	NASHVILLE RESERVOIR (PROPOSED)	532.	P			P	P	P	P	P
59	SOURCE TO DELTA MOKELUMNE RIVER	531/ 532	E	E E			E E	E E	E E	E E
60	SOURCES TO PARDEE RESERVOIR	532.6	E				E E	E E	E E	E E
61	PARDEE RESERVOIR (6)	532.6	E				E E	E E	E E	E E
62	CAMANCHE RESERVOIR	531.2	E	E			E E	E E	E E	E E
63	CAMANCHE RESERVOIR TO DELTA CALAVERAS RIVER	531.2		E E			E E	E E	E E	E E
64	SOURCE TO NEW HOGAN RESERVOIR	533.					E E	E E	E E	E E
65	NEW HOGAN RESERVOIR	533.1					E E	E E	E E	E E
66	NEW HOGAN RESERVOIR TO DELTA	531.3	E	E E	P P	E	E E	E E	E E	E E
	OTHER LAKES AND RESERVOIRS IN HYDRO UNIT NOS.531, 532, 533, 543, 544 (5)		E	E E	E	E	E E	E E	E E	E E

Notes are located after the table.

TABLE 2-1 (cont'd)

SURFACE WATER BODIES AND BENEFICIAL USES

	SURFACE WATER BODIES	HYDRO UNIT NUMBER	AGRICUL -TURE		INDUSTRY			RECREATION		FRESH- WATER HABITAT (2)		MIGRA- TION	SPAW- NING		WILD NAV		
			MUN	AGR	PR OC	IND	PO W	REC-1		REC-2	WARM		COLD				
								CONTACT	CANOEING AND RAFTING (1)					OTHER NONCONTACT			
	SAN JOAQUIN RIVER																NAVIGATION
67	SOURCES TO MILLERTON LAKE	540.	E	E				E	E	E							WILDLIFE HABITAT
68	MILLERTON LAKE	540.12	P	E	E				E		P						
69	FRIANT DAM TO MENDOTA POOL	545.	E	E	E	E			E	E	E	E	E	P	E		
70	MENDOTA DAM TO SACK DAM	545.1	P	E	E	E			E	E	E	E	E	P	E		
71	SACK DAM TO MOUTH OF MERCED RIVER	535.7	P	E	E	E			E	E	E	E	E	P	E		
	FRESNO RIVER																
72	SOURCE TO HIDDEN RESERVOIR A/	539.31	E	E	E				E		E	E				E	
73	HIDDEN RESERVOIR A/	539.32	E	E					E		E					E	
74	HIDDEN RESERVOIR TO SAN JOAQUIN RIVER	545.	P	E	E				E	P	E	E				E	
	CHOWCHILLA RIVER																
75	SOURCE TO BUCHANAN RESERVOIR B/	539.11							E		E	E	E			E	
76	BUCHANAN RESERVOIR B/	539.12	E	E	E				E		E	E				E	
77	BUCHANAN RESERVOIR TO SAN JOAQUIN RIVER	535/ 545	P	E		E			E	P	E	E				E	
	MERCED RIVER																
78	SOURCE TO McCLURE LAKE	537.	P	E				E	E	E	E	E				E	
79	McCLURE LAKE	537.22	P	E				E	E	E	E	E				E	

Notes are located after the table.

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TABLE 2-1 (cont'd)

SURFACE WATER BODIES AND BENEFICIAL USES

	SURFACE WATER BODIES	HYDRO UNIT NUMBER	AGRICUL-TURE		INDUSTRY			RECREATION		FRESH-WATER HABITAT (2)		MIGRA-TION	SPAW-NING		WILD NAV
			MUN	AGR	PR OC	IND	PO W	REC-1	REC-2	WARM	COLD		MIGR	SPWN	
												IRRIGATION			STOCK WATERING
80	McSWAIN RESERVOIR	537.1	P	E				E	E	E	E				E
81	McSWAIN RESERVOIR TO SAN JOAQUIN RIVER	535.	E		E	E	E	E	E	E	E	E	E	E	E
82	YOSEMITE LAKE	535.9						E		E	E				E
83	MOUTH OF MERCED RIVER TO VERNALIS	535/541	P	E	E	E			E	E	E	E	E		E
	TUOLUMNE RIVER														
84	SOURCE TO (NEW) DON PEDRO RESERVOIR	536.	E	E	E			E	E	E	E				E
85	NEW DON PEDRO RESERVOIR	536.32	P					E	E	E	E				E
	NEW DON PEDRO RESERVOIR TO SAN JOAQUIN RIVER	535.	P	E	E				E	E	E	E	E	E	E
	STANISLAUS RIVER														
87	SOURCE TO NEW MELONES RESERVOIR (PROPOSED)	534.	E	E	E			E	E	E	E				E
88	NEW MELONES RESERVOIR	534.21	E	E	E			E	E	E	E				E
89	TULLOCH RESERVOIR	534.22	P	E	E				E	E					E
90	GOODWIN DAM TO SAN JOAQUIN RIVER	535.	P	E	E	E	E	E	E	E	E	E	E	E	E
91	SAN LUIS RESERVOIR	542.32	E	E	E		E	E	E						E
92	O'NEILL RESERVOIR	541.2	E	E	E				E	E	E				

Notes are located after the table.

BENEFICIAL USES

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TABLE 2-1 (cont'd)

SURFACE WATER BODIES AND BENEFICIAL USES

	SURFACE WATER BODIES	HYDRO UNIT NUMBER		AGRICUL-TURE	INDUSTRY			RECREATION		FRESH-WATER HABITAT (2)		MIGRA-TION	SPAW-NING														
					PR OC	IND	PO W	REC-1	REC-2	WARM	COLD																
	OTHER LAKES AND RESERVOIRS IN SAN JOAQUIN R. BASIN (EXCLUDING HYDRO UNIT NOS. 531-533, 543, 544) (5)	MUNICIPAL AND DOMESTIC SUPPLY	IRRIGATION	STOCK WATERING	PROCESS	SERVICE SUPPLY	POWER	CONTACT	CANOEING AND RAFTING (1)	OTHER NONCONTACT	WARM	COLD	WARM (3)	COLD (4)	WILDLIFE HABITAT	NAVIGATION											
93																											
94													E	E			E	E	E	E	E	E	E	E	E	E	E
													541.	E			E	E	E	E	E	E	E	E	E	E	E
95	DELTA-MENDOTA CANAL	541/ 543	E	E	E			E	E	E	E	E			E												
	GRASSLAND WATERSHED (a)	541.2																									
96	MUD SLOUGH (NORTH)			L					E	E	E	E			E												
97	SALT SLOUGH			(b)	E	E		E	E	E	E	E			E												
98	WETLAND WATER SUPPLY CHANNELS (9)			L							L (c)				E												
C	SACRAMENTO SAN JOAQUIN DELTA (7, 8)	544.	E	E	E	E	E	E	E	E	E	E	E	E	E	E											

Notes are located after the table.

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SURFACE WATER BODIES AND BENEFICIAL USES**LEGEND**

E = EXISTING BENEFICIAL USES

P = POTENTIAL BENEFICIAL USES

L = EXISTING LIMITED BENEFICIAL USE

NOTE:

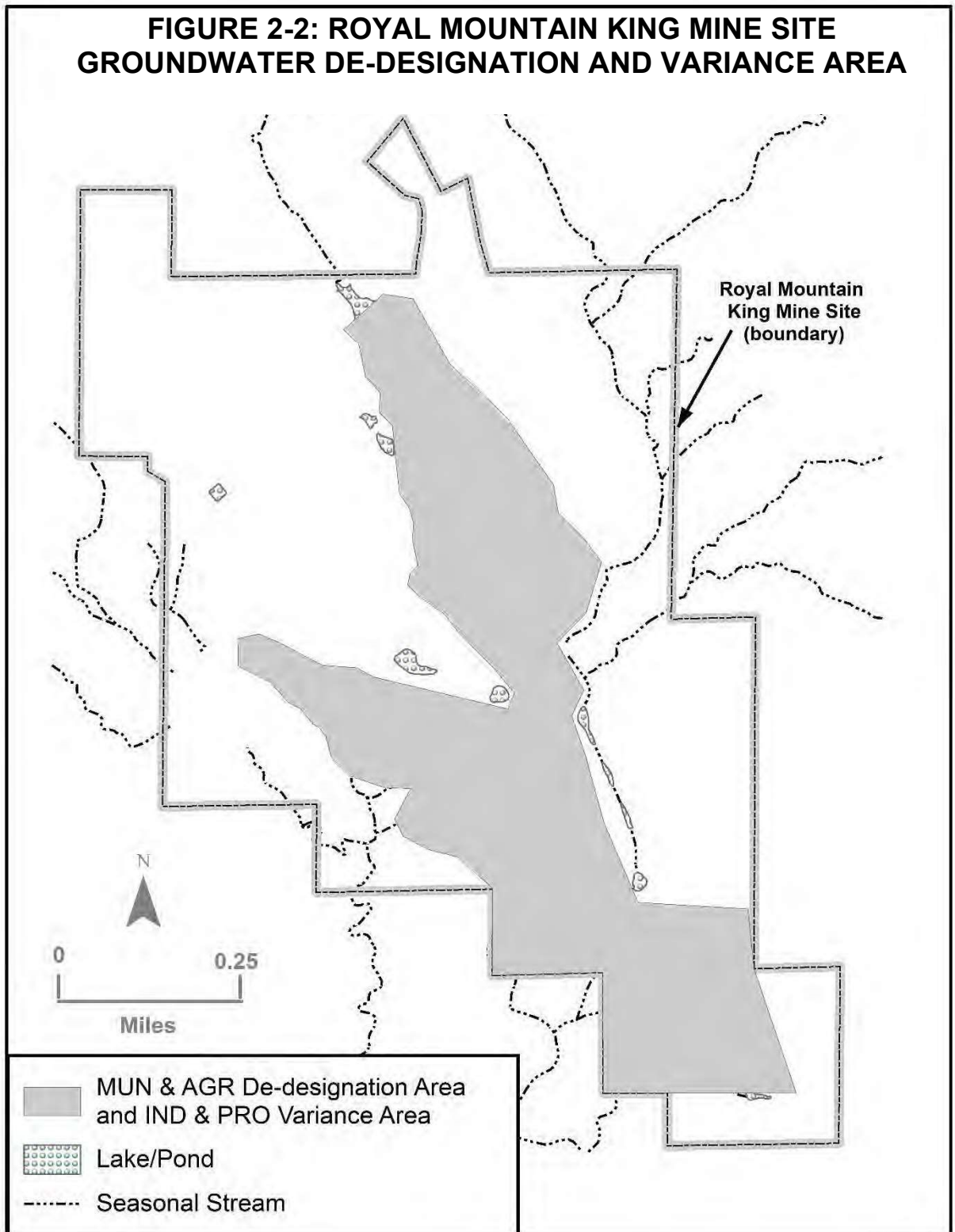
Surface waters with the beneficial uses of Groundwater Recharge (GWR), Freshwater Replenishment (FRSH), and Preservation of Rare and Endangered Species (RARE) have not been identified in this plan. Surface waters of the Sacramento and San Joaquin River Basins falling within these beneficial use categories will be identified in the future as part of the continuous planning process to be conducted by the State Water Resources Control Board.

- (1) Shown for streams and rivers only with the implication that certain flows are required for this beneficial use.
- (2) Resident does not include anadromous. Any Segments with both COLD and WARM beneficial use designations will be considered COLD water bodies for the application of water quality objectives.
- (3) Striped bass, sturgeon, and shad.
- (4) Salmon and steelhead
- (5) The indicated beneficial uses are to be protected for all waters except in specific cases where evidence indicates the appropriateness of additional or alternative beneficial use designations.
- (6) Sport fishing is the only recreation activity permitted.
- (7) Beneficial uses vary throughout the Delta and will be evaluated on a case-by-case basis. COMM is a designated beneficial use for the Sacramento San Joaquin Delta and Yolo Bypass waterways listed in Appendix 43 and not any tributaries to the listed waterways or portions of the listed waterways outside of the legal Delta boundary unless specifically designated.
- (8) Per State Water Board Resolution No. 90-28, Marsh Creek and Marsh Creek Reservoir in Contra Costa County are assigned the following beneficial uses: REC1 and REC2 (potential uses), WARM, WILD and RARE. COMM is a designated beneficial use for Marsh Creek and its tributaries listed in Appendix 43 within the legal Delta boundary.
- (9) Wetland water supply channels for which beneficial uses are designated are defined in Appendix 40

A/ Hidden Reservoir = Hensley Lake

B/ Buchanan Reservoir = Eastman Lake

- (a) The following beneficial uses EXIST in addition to those noted in [Table 2-1](#)
 - Mud Slough (north): COMM and SHELL
 - Salt Slough: COMM, BIOL, and SHELL
 - Wetland Water Supply Channels: BIOL
 - Clear Lake: COMM
- (b) Elevated natural salt and boron concentrations may limit this use to irrigation of salt and boron tolerant crops. Intermittent low flow conditions may also limit this use.
- (c) Wetland channels can sustain aquatic life, but due to fluctuating flow regimes and habitat limitations, may not be suitable for nesting and/or propagation.
- (d) In addition to the beneficial uses noted in [Table 2-1](#), COMM exists for Cache Creek from Clear Lake to Yolo Bypass and in the following tributaries only: North Fork Cache Creek and Bear Creek.



3 WATER QUALITY OBJECTIVES

The Porter-Cologne Water Quality Control Act defines water quality objectives as "...the limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area" [Water Code Section 13050(h)]. It also requires the Regional Water Board to establish water quality objectives, while acknowledging that it is possible for water quality to be changed to some degree without unreasonably affecting beneficial uses. In establishing water quality objectives, the Regional Water Board must consider, among other things, the following factors:

- Past, present, and probable future beneficial uses;
- Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto;
- Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area;
- Economic considerations;
- The need for developing housing within the region;
- The need to develop and use recycled water. (Water Code Section 13241)

The Federal Clean Water Act requires a state to submit for approval of the Administrator of the U.S. Environmental Protection Agency (USEPA) all new or revised water quality standards which are established for surface and ocean waters. As noted earlier, California water quality standards consist of both beneficial uses (identified in Chapter 2) and the water quality objectives based on those uses.

There are **seven important points** that apply to water quality objectives.

The **first point** is that water quality objectives can be revised through the basin plan amendment process. Objectives may apply region-wide or be specific to individual water bodies or parts of water bodies. Site-specific objectives may be developed whenever the Regional Water Board believes they are appropriate. As indicated previously, federal regulations call for each state to review its water quality standards at least every three years. These Triennial Reviews provide one opportunity to evaluate changing water quality objectives, because they begin with an identification of potential and actual water quality problems, i.e., beneficial use impairments. Since impairments may be associated with water quality objectives being exceeded, the Regional Water Board uses the results of the Triennial Review to implement actions to assess, remedy, monitor, or otherwise address the impairments, as appropriate, in order to achieve objectives and protect beneficial uses. If a problem is found to occur because, for example, a water quality objective is too weak to protect beneficial uses, the Basin Plan should be amended to make the objective more stringent. (Better enforcement of the water quality objectives or adoption of certain policies or redirection of staff and resources may also be proper responses to water quality problems. See the Implementation chapter for further discussion.)

Changes to the objectives can also occur because of new scientific information on the effects of specific constituents. A major source of information is the USEPA which develops data on the effects of chemical and other constituent concentrations on particular aquatic species and human health. Other information sources for data on protection of beneficial uses include the National Academy of Science which has published data on bioaccumulation and the Federal

Food and Drug Administration which has issued criteria for unacceptable levels of chemicals in fish and shellfish used for human consumption. The Regional Water Board may make use of those and other state or federal agency information sources in assessing the need for new water quality objectives.

The **second point** is that achievement of the objectives depends on applying them to controllable water quality factors. Controllable water quality factors are those actions, conditions, or circumstances resulting from human activities that may influence the quality of the waters of the State, that are subject to the authority of the State Water Board or the Regional Water Board, and that may be reasonably controlled. Controllable factors are not allowed to cause further degradation of water quality in instances where uncontrollable factors have already resulted in water quality objectives being exceeded. The Regional Water Board recognizes that man made changes that alter flow regimes can affect water quality and impact beneficial uses.

The **third point** is that objectives are to be achieved primarily through the adoption of waste discharge requirements (including permits) and cleanup and abatement orders. When adopting requirements and ordering actions, the Regional Water Board considers the potential impact on beneficial uses within the area of influence of the discharge, the existing quality of receiving waters, and the appropriate water quality objectives. It can then make a finding as to the beneficial uses to be protected within the area of influence of the discharge and establish waste discharge requirements to protect those uses and to meet water quality objectives. The objectives contained in this plan, and any State or Federally promulgated objectives applicable to the basins covered by the plan, are intended to govern the levels of constituents and characteristics in the main water mass unless otherwise designated. They may not apply at or in the immediate vicinity of effluent discharges, but at the edge of the mixing zone if areas of dilution or criteria for diffusion or dispersion are defined in the waste discharge specifications.

The **fourth point** is that the Regional Water Board recognizes that immediate compliance with water quality objectives adopted by the Regional Water Board or the State Water Board, or with water quality criteria adopted by the USEPA, may not be feasible in all circumstances. Where the Regional Water Board determines it is infeasible for a discharger to comply immediately with such objectives or criteria, compliance shall be achieved in the shortest practicable period of time (determined by the Regional Water Board), not to exceed ten years after the adoption of applicable objectives or criteria. This policy shall apply to water quality objectives and water quality criteria adopted after the effective date of this amendment to the Basin Plan [25 September 1995]. The Regional Water Board will establish compliance schedules in NPDES permits consistent with the provisions of the State Water Board's Compliance Schedule Policy (Resolution 2008-0025). Time schedules in waste discharge requirements are established consistent with Water Code Section 13263.

The **fifth point** is that in cases where water quality objectives are formulated to preserve historic conditions, there may be insufficient data to determine completely the temporal and hydrologic variability representative of historic water quality. When violations of such objectives occur, the Regional Water Board judges the reasonableness of achieving those objectives through regulation of the controllable factors in the areas of concern.

The **sixth point** is that the State Water Board adopts policies and plans for water quality control which can specify water quality objectives or affect their implementation. Chief among the State Water Board's policies for water quality control is State Water Board Resolution No. 68-16 (Statement of Policy with Respect to Maintaining High Quality of Waters in California). It requires that wherever the existing quality of surface or ground waters is better than the objectives established for those waters in a basin plan, the existing quality will be maintained unless as otherwise provided by Resolution No. 68- 16 or any revisions thereto. This policy and others establish general objectives. The State Water Board's water quality control plans applicable to the Sacramento and San Joaquin River Basins are the Thermal Plan and Water

Quality Control Plan for Salinity. The Thermal Plan and its water quality objectives are in the Appendix. The State Water Board's plans and policies that the Basin Plan must conform to are addressed in Chapter 4, Implementation.

The **seventh point** is that water quality objectives may be in numerical or narrative form. The enumerated milligram-per-liter (mg/l) limit for copper is an example of a numerical objective; the objective for color is an example of a narrative form.

Information on the application of water quality objectives is contained in the section, *Policy for Application of Water Quality Objectives*, in Chapter 4.

3.1 WATER QUALITY OBJECTIVES FOR INLAND SURFACE WATERS

The objectives below are presented by categories which, like the Beneficial Uses of Chapter 2, were standardized for uniformity among the Regional Water Boards. The water quality objectives apply to all surface waters in the Sacramento and San Joaquin River Basins, including the Delta, or as noted. (*The legal boundary of the Delta is contained in Section 12220 of the Water Code and identified in [Figure 2-1](#).*) The numbers in parentheses following specific water bodies are keyed to [Figure 2-1](#).

3.1.1 Bacteria

In waters designated for contact recreation (REC-1), the fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed a geometric mean of 200/100 ml, nor shall more than ten percent of the total number of samples taken during any 30-day period exceed 400/100 ml.

For Folsom Lake (50), the fecal coliform concentration based on a minimum of not less than five samples for any 30-day period, shall not exceed a geometric mean of 100/100 ml, nor shall more than ten percent of the total number of samples taken during any 30-day period exceed 200/100 ml.

3.1.2 Biostimulatory Substances

Water shall not contain biostimulatory substances which promote aquatic growths in concentrations that cause nuisance or adversely affect beneficial uses.

3.1.3 Chemical Constituents

Waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses.*

The chemical constituent objectives in [Tables 3-1](#) and [3-2](#) apply to the water bodies specified. Metal objectives in the table are dissolved concentrations.

Selenium, molybdenum, and boron objectives are total concentrations. Water quality objectives are also contained in the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta, adopted by the State Water Board in May 1995 and revised in 2006.

At a minimum, water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs) specified in the following provisions of Title 22 of the California Code of Regulations, which are incorporated by reference into this plan: Tables 64431-A (Inorganic Chemicals) and

64431-B (Fluoride) of Section 64431, Table 64444-A (Organic Chemicals) of Section 64444, and Tables 64449-A (Secondary Maximum Contaminant Levels-Consumer Acceptance Limits) and 64449-B (Secondary Maximum Contaminant Levels-Ranges) of Section 64449. This incorporation-by-reference is prospective, including future changes to the incorporated provisions as the changes take effect. At a minimum, water designated for use as domestic or municipal supply (MUN) shall not contain lead in excess of 0.015 mg/l. The Regional Water Board acknowledges that specific treatment requirements are imposed by state and federal drinking water regulations on the consumption of surface waters under specific circumstances. To protect all beneficial uses the Regional Water Board may apply limits more stringent than MCLs.

**This includes drinking water chemical constituents of concern, such as organic carbon.*

**TABLE 3-1
TRACE ELEMENT WATER QUALITY OBJECTIVES**

<u>CONSTITUENT</u>	<u>MAXIMUM CONCENTRATION^a</u> <u>(mg/l)</u>	<u>APPLICABLE WATER BODIES</u>
Arsenic	0.01	Sacramento River from Keswick Dam to the I Street Bridge at City of Sacramento (13, 30); American River from Folsom Dam to the Sacramento River (51); Folsom Lake (50); and the Sacramento-San Joaquin Delta.
Barium	0.1	As noted above for Arsenic.
Boron	2.0 (15 March through 15 September) 0.8 (monthly mean, 15 March through 15 September) 2.6 (16 September through 14 March) 1.0 (monthly mean, 16 September through 14 March) 1.3 (monthly mean, critical year ^b) 5.8 2.0 (monthly mean, 15 March through 15 September)	San Joaquin River, mouth of the Merced River to Vernalis Salt Slough, Mud Slough (north), San Joaquin River from Sack Dam to the mouth of Merced River
Cadmium	0.00022 ^c	Sacramento River and its tributaries above State Hwy 32 bridge at Hamilton City
Copper	0.0056 ^c 0.01 ^d	As noted above for Cadmium. As noted above for Arsenic. ^d
Cyanide	0.01	As noted above for Arsenic.

**TABLE 3-1
TRACE ELEMENT WATER QUALITY OBJECTIVES**

<u>CONSTITUENT</u>	<u>MAXIMUM CONCENTRATION^a</u> <u>(mg/l)</u>	<u>APPLICABLE WATER BODIES</u>
Iron	0.3	As noted above for Arsenic.
Manganese	0.05	As noted above for Arsenic.
Molybdenum	0.015	San Joaquin River, mouth of the Merced River to Vernalis
	0.010 (monthly mean)	
	0.050 0.019 (monthly mean)	Salt Slough, Mud Slough (north), San Joaquin River from Sack Dam to the mouth of Merced River
Selenium	0.012	San Joaquin River, mouth of the Merced River to Vernalis
	0.005 (4-day average)	
	0.020 0.005 (4-day average)	Mud Slough (north), and the San Joaquin River from Sack Dam to the mouth of Merced River
	0.020 0.002 (monthly mean)	
Silver	0.01	As noted above for Arsenic
Zinc	0.1 ^d	As noted above for Arsenic. ^d
	0.016 ^c	As noted above for Cadmium.

a Metal objectives in this table are dissolved concentrations. Selenium, molybdenum, and boron objectives are total concentrations.

b See [Table 4-3](#).

c The effects of these concentrations were measured by exposing test organisms to dissolved aqueous solutions of 40 mg/l hardness that had been filtered through a 0.45 micron membrane filter. Where deviations from 40 mg/l of water hardness occur, the objectives, in mg/l, shall be determined using the following formulas:

$$Cu = e (0.905) (\ln \text{ hardness}) - 1.612 \times 10^{-3}$$

$$Zn = e (0.830) (\ln \text{ hardness}) - 0.289 \times 10^{-3}$$

$$Cd = e (1.160) (\ln \text{ hardness}) - 5.777 \times 10^{-3}$$

d Does not apply to Sacramento River above State Hwy. 32 bridge at Hamilton City. See relevant objectives (c) above.

TABLE 3-2
ORGANIC CHEMICAL WATER QUALITY OBJECTIVES

<u>CONSTITUENT</u>	<u>MAXIMUM CONCENTRATION</u> ($\mu\text{g/l}$)	<u>APPLICABLE WATER BODIES</u>
Chlorodibromomethane (DBCM)	4.9	New Alamo Creek, from Old Alamo Creek to Ulati Creek; Ulati Creek, from New Alamo Creek to Cache Slough
Dichlorobromomethane (DCBM)	16	New Alamo Creek, from Old Alamo Creek to Ulati Creek; Ulati Creek, from New Alamo Creek to Cache Slough
Chloroform	46	New Alamo Creek, from Old Alamo Creek to Ulati Creek; Ulati Creek, from New Alamo Creek to Cache Slough

3.1.4 *Cryptosporidium* and *Giardia*

Waters shall not contain *Cryptosporidium* and *Giardia* in concentrations that adversely affect the public water system component¹ of the MUN beneficial use. This narrative water quality objective for *Cryptosporidium* and *Giardia* shall be applied within the Sacramento-San Joaquin Delta and its tributaries below the first major dams (shown in Figure A44-1) and should be implemented as specified in Chapter 4 of the Basin Plan. Compliance with this objective will be assessed at existing and new public water system intakes.

¹ Public water system as defined in Health and Safety Code, section 116275, subdivision (h)

3.1.5 Color

Water shall be free of discoloration that causes nuisance or adversely affects beneficial uses.

3.1.6 Dissolved Oxygen

Within the legal boundaries of the Delta, the dissolved oxygen concentration shall not be reduced below:

7.0 mg/l in the Sacramento River (below the I Street Bridge) and in all Delta waters west of the Antioch Bridge; 6.0 mg/l in the San Joaquin River (between Turner Cut and Stockton, 1 September through 30 November); and 5.0 mg/l in all other Delta waters except for those bodies of water which are constructed for special purposes and from which fish have been excluded or where the fishery is not important as a beneficial use.

For surface water bodies outside the legal boundaries of the Delta, the monthly median of the mean daily dissolved oxygen (DO) concentration shall not fall below 85 percent of saturation in the main water mass, and the 95 percentile concentration shall not fall below 75 percent of saturation. The dissolved oxygen concentrations shall not be reduced below the following minimum levels at any time:

Waters designated WARM 5.0 mg/l
 Waters designated COLD 7.0 mg/l
 Waters designated SPWN 7.0 mg/l

The more stringent objectives in [Table 3-3](#) apply to specific water bodies in the Sacramento and San Joaquin River Basins:

**TABLE 3-3
 SPECIFIC DISSOLVED OXYGEN WATER QUALITY OBJECTIVES**

<u>AMOUNT</u>	<u>TIME</u>	<u>PLACE</u>
9.0 mg/l *	1 June to 31 August	Sacramento River from Keswick Dam to Hamilton City (13)
8.0 mg/l	1 September to 31 May	Feather River from Fish Barrier Dam at Oroville to Honcut Creek (40)
8.0 mg/l	all year	Merced River from Cressy to New Exchequer Dam (78)
8.0 mg/l	15 October to 15 June	Tuolumne River from Waterford to La Grange (86)
* When natural conditions lower dissolved oxygen below this level, the concentrations shall be maintained at or above 95 percent of saturation.		

3.1.7 Floating Material

Water shall not contain floating material in amounts that cause nuisance or adversely affect beneficial uses.

3.1.8 Mercury

For Sulphur Creek (Colusa County), waters shall be maintained free of mercury from anthropogenic sources such that beneficial uses are not adversely affected. During low flow conditions, defined as flows less than 3 cfs, the instantaneous maximum total mercury concentration shall not exceed 1,800 ng/l. During high flow conditions, defined as flows greater than 3 cfs, the instantaneous maximum ratio of mercury to total suspended solids shall not exceed 35 mg/kg. Both objectives apply at the mouth of Sulphur Creek.

3.1.9 Methylmercury

For Clear Lake (53), the methylmercury concentration in fish tissue shall not exceed 0.09 and 0.19 mg methylmercury/kg wet weight of tissue in trophic level 3 and 4 fish, respectively.

For Cache Creek (Clear Lake to Yolo Bypass) (54), North Fork Cache Creek, and Bear Creek (tributary to Cache Creek), the average methylmercury concentration shall not exceed 0.12 and 0.23 mg methylmercury/ kg wet weight of muscle tissue in trophic level 3 and 4 fish, respectively. For Harley Gulch (tributary to Cache Creek), the average methylmercury concentration shall not exceed 0.05 mg methylmercury/ kg wet weight in whole, trophic level 2 and 3 fish.

For the Sacramento-San Joaquin Delta and Yolo Bypass waterways listed in Appendix 43, the average methylmercury concentrations shall not exceed 0.08 and 0.24 mg methylmercury/kg, wet weight, in muscle tissue of trophic level 3 and 4 fish, respectively (150-500 mm total length). The average methylmercury concentrations shall not exceed 0.03 mg methylmercury/kg, wet weight, in whole fish less than 50 mm in length.

Compliance with the methylmercury fish tissue objectives shall be determined by analysis of fish tissue as described in Chapter 5, Surveillance and Monitoring.

3.1.10 Oil and Grease

Waters shall not contain oils, greases, waxes, or other materials in concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses.

3.1.11 pH

The pH shall not be depressed below 6.5 nor raised above 8.5.

The following site-specific objectives replace the general pH objective, above, in its entirety for the listed water bodies.

For Goose Lake (2), pH shall be less than 9.5 and greater than 7.5 at all times.

3.1.12 Pesticides

- No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.
- Discharges shall not result in pesticide concentrations in bottom sediments or aquatic life that adversely affect beneficial uses.
- Total identifiable persistent chlorinated hydrocarbon pesticides shall not be present in the water column at concentrations detectable within the accuracy of analytical methods approved by the Environmental Protection Agency or the Executive Officer.
- Pesticide concentrations shall not exceed those allowable by applicable antidegradation policies (see State Water Resources Control Board Resolution No. 68-16 and 40 C.F.R. Section 131.12.).
- Pesticide concentrations shall not exceed the lowest levels technically and economically achievable.
- Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of pesticides in excess of the Maximum Contaminant Levels set forth in California Code of Regulations, Title 22, Division 4, Chapter 15.

- Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of thiobencarb in excess of 1.0 µg/l.

Pesticide concentrations shall not exceed the levels identified in [Table 3-4](#). Where more than one objective may be applicable, the most stringent objective applies.

For the purposes of this objective, the term pesticide shall include: (1) any substance, or mixture of substances which is intended to be used for defoliating plants, regulating plant growth, or for preventing, destroying, repelling, or mitigating any pest, which may infest or be detrimental to vegetation, man, animals, or households, or be present in any agricultural or nonagricultural environment whatsoever, or (2) any spray adjuvant, or (3) any breakdown products of these materials that threaten beneficial uses. Note that discharges of "inert" ingredients included in pesticide formulations must comply with all applicable water quality objectives.

**TABLE 3-4
SPECIFIC PESTICIDE OBJECTIVES**

<u>PESTICIDE</u>	<u>MAXIMUM CONCENTRATION AND AVERAGING PERIOD</u>	<u>APPLICABLE WATER BODIES</u>
Chlorpyrifos	0.025 µ g/L ; 1-hour average (acute) 0.015 µ g/L ; 4-day average (chronic) Not to be exceeded more than once in a three year period.	<p>San Joaquin River from Mendota Dam to Vernalis (Reaches include Mendota Dam to Sack Dam (70), Sack Dam to Mouth of Merced River (71), Mouth of Merced River to Vernalis (83)), Delta Waterways listed in Appendix 42. Sacramento River from Shasta Dam to Colusa Basin Drain (13) and the Sacramento River from the Colusa Basin Drain to I Street Bridge (30). Feather River from Fish Barrier Dam to Sacramento River (40).</p> <p>Bear Creek (San Joaquin and Calaveras Counties), Bear River (43), Lower (below Camp Far West Reservoir), Berenda Creek (Madera County), Berenda Slough (Madera County), Colusa Basin Drain (29), Coon Creek, Lower (Sutter County), Deadman Creek (Merced County), Del Puerto Creek, Dry Creek (tributary to Tuolumne River at Modesto, E Stanislaus County), Duck Creek (San Joaquin County), French Camp Slough, Gilsizer Slough , Ingram Creek, Jack Slough, Live Oak Slough, Lone Tree Creek, Main Drainage Canal (Butte County), Merced River, Lower (McSwain Reservoir to San Joaquin River) (81), Mormon Slough (from Stockton Diverting Canal to Bellota Weir), Morrison Slough (Sutter County), Orestimba Creek, Pixley Slough (San Joaquin County), Salt Slough, Spring Creek (Colusa County), Stanislaus River, Lower (Goodwin Dam to San Joaquin River) (90), Tuolumne River, Lower (Don Pedro Dam to San Joaquin River) (86), Ulati Creek (Solano County), Wadsworth Canal, Westley Wasteway (Stanislaus County), Winters Canal (Yolo County), Yankee Slough (Placer and Sutter Counties)</p> <p>Waters with designated or existing² WARM and/or COLD beneficial uses that are not upstream of the major dams in Table 3-5.</p>
Diazinon	0.16 µ g/L; 1-hour average (acute) 0.10 µ g/L; 4-day average (chronic) Not to be exceeded more than once in a three year period.	As noted above for chlorpyrifos

² Existing as defined in Title 40 of the Code of Federal Regulations, section 131.3(e)

TABLE 3-5 MAJOR DAMS DEMARKING THE UPSTREAM EXTENT OF THE WATER BODIES WITH DIAZINON AND CHLORPYRIFOS WATER QUALITY OBJECTIVES		
Dam	Associated Reservoir	River System
Monticello Dam	Lake Berryessa (55)	Putah Creek
Black Butte Dam	Black Butte Reservoir (26)	Stony Creek
Camanche Dam	Camanche Reservoir (62)	Mokelumne River
Camp Far West Dam	Camp Far West Reservoir	Bear River
Cache Creek Dam	Clear Lake (53)	Cache Creek
New Don Pedro Dam	Don Pedro Reservoir (85)	Tuolumne River
Buchanan Dam	Eastman Lake (Buchanan Reservoir) (76)	Chowchilla River
Folsom Dam	Folsom Lake (50)	American River
Englebright Dam	Harry L. Englebright Reservoir	Yuba River
Hidden Dam	Hensley Lake (Hidden Reservoir) (73)	Fresno River
Keswick Dam	Keswick Reservoir	Sacramento River
New Exchequer Dam	McClure Lake (Exchequer Reservoir) (79)	Merced River
Friant Dam	Millerton Lake (68)	San Joaquin River
New Hogan Dam	New Hogan Reservoir (65)	Calaveras River
Oroville Dam	Lake Oroville (39)	Feather River
San Luis Dam	San Luis Reservoir (91)	-
Scotts Flat Dam	Scotts Flat Reservoir	Deer Creek
Goodwin Dam	Tulloch Reservoir (89)	Stanislaus River
Whiskeytown Dam	Whiskeytown Reservoir (14)	Clear Creek

3.1.13 Radioactivity

Radionuclides shall not be present in concentrations that are harmful to human, plant, animal or aquatic life nor that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal or aquatic life.

At a minimum, waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of radionuclides in excess of the maximum contaminant levels (MCLs) specified in Table 64442 of Section 64442 and Table 64443 of Section 64443 of Title 22 of the California Code of Regulations, which are incorporated by reference into this plan. This incorporation-by-reference is prospective, including future changes to the incorporated provisions as the changes take effect.

3.1.14 Salinity

3.1.14.1 Electrical Conductivity and Total Dissolved Solids--Special Cases in the Sacramento and San Joaquin River Basins Other Than the Delta

The objectives for electrical conductivity and total dissolved solids in [Table 3-6](#) apply to the water bodies specified. To the extent of any conflict with the general Chemical Constituents water quality objectives, the more stringent shall apply.

**TABLE 3-6
ELECTRICAL CONDUCTIVITY AND TOTAL DISSOLVED SOLIDS**

<u>PARAMETER</u>	<u>WATER QUALITY OBJECTIVES</u>	<u>APPLICABLE WATER BODIES</u>
Electrical Conductivity (at 25°C)	Shall not exceed 230 micromhos/cm (50 percentile) or 235 micromhos/cm (90 percentile) at Knights Landing above Colusa Basin Drain; or 240 micromhos/cm (50 percentile) or 340 micromhos/cm (90 percentile) at I Street Bridge, based upon previous 10 years of record.	Sacramento River (13, 30)
	Shall not exceed 150 micromhos/cm (90 percentile) in well-mixed waters of the Feather River.	North Fork of the Feather River (33); Middle Fork of the Feather River from Little Last Chance Creek to Lake Oroville (36); Feather River from the Fish Barrier Dam at Oroville to Sacramento River (40)
	Shall not exceed 150 micromhos/cm from Friant Dam to Gravelly Ford (90 percentile).	San Joaquin River, Friant Dam to Mendota Pool (69)
Total Dissolved Solids	Shall not exceed 125 mg/l (90 percentile)	North Fork of the American River from the source to Folsom Lake (44); Middle Fork of the American River from the source to Folsom Lake (45); South Fork of the American River from the source to Folsom Lake (48, 49); American River from Folsom Dam to Sacramento River (51)
	Shall not exceed 100 mg/l (90 percentile)	Folsom Lake (50)
	Shall not exceed 1,300,000 tons	Goose Lake (2)

3.1.14.2 Electrical Conductivity, Total Dissolved Solids, and Chloride--Delta Waters

See the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, 2006, for salinity objectives applicable in the Delta.

3.1.15 Sediment

The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

3.1.16 Settleable Material

Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.

3.1.17 Suspended Material

Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.

3.1.18 Tastes and Odors

Water shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to domestic or municipal water supplies or to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses.

3.1.19 Temperature

The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration in temperature does not adversely affect beneficial uses.

Temperature objectives for COLD interstate waters, WARM interstate waters, and Enclosed Bays and Estuaries are as specified in the *Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays of California* including any revisions. There are also temperature objectives for the Delta in the State Water Board's 2006 *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary*.

At no time or place shall the temperature of COLD or WARM intrastate waters be increased more than 5°F above natural receiving water temperature. Temperature changes due to controllable factors shall be limited for the water bodies specified as described in [Table 3-7](#). To the extent of any conflict with the above, the more stringent objective applies.

In determining compliance with the water quality objectives for temperature, appropriate averaging periods may be applied provided that beneficial uses will be fully protected.

**TABLE 3-7
SPECIFIC TEMPERATURE OBJECTIVES**

<u>DATES</u>	<u>APPLICABLE WATER BODY</u>
From 1 December to 15 March, the maximum temperature shall be 55°F.	Sacramento River from its source to Box Canyon Reservoir (9); Sacramento River from Box Canyon Dam to Shasta Lake (11)
From 16 March to 15 April, the maximum temperature shall be 60°F.	
From 16 April to 15 May, the maximum temperature shall be 65°F.	
From 16 May to 15 October, the maximum temperature shall be 70°F.	
From 16 October to 15 November, the maximum temperature shall be 65°F.	Lake Siskiyou (10)
From 16 November to 30 November, the maximum temperature shall be 60°F.	
The temperature in the epilimnion shall be less than or equal to 75°F or mean daily ambient air temperature, whichever is greater.	
The temperature shall not be elevated above 56°F in the reach from Keswick Dam to Hamilton City nor above 68°F in the reach from Hamilton City to the I Street Bridge during periods when temperature increases will be detrimental to the fishery.	Sacramento River from Shasta Dam to I Street Bridge (13, 30)

The following site-specific objective replaces the general temperature objective, above, in its entirety for the listed water body:

For Deer Creek, source to Cosumnes River, temperature changes due to controllable factors shall not cause creek temperatures to exceed the objectives specified in [Table 3-8](#).

**TABLE 3-8
DEER CREEK TEMPERATURE OBJECTIVES**

Date	Daily Maximum (°F) ^a	Monthly Average (°F) ^b
January and February	63	58
March	65	60
April	71	64
May	77	69
June	81	74
July through Sept.	81	77
October	77	72
November	73	65
December	65	58

a Maximum not to be exceeded.

b Defined as a calendar month average

3.1.20 Toxicity

All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances. Compliance with this objective will be determined by analyses of indicator organisms, species diversity, population density, growth anomalies, and biotoxicity tests of appropriate duration or other methods as specified by the Regional Water Board.

The Regional Water Board will also consider all material and relevant information submitted by the discharger and other interested parties and numerical criteria and guidelines for toxic substances developed by the State Water Board, the California Office of Environmental Health Hazard Assessment, the State Water Board Division of Drinking Water Programs, the U.S. Food and Drug Administration, the National Academy of Sciences, the U.S. Environmental Protection Agency, and other appropriate organizations to evaluate compliance with this objective.

The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors shall not be less than that for the same water body in areas unaffected by the waste discharge, or, when necessary, for other control water that is consistent with the requirements for "experimental water" as described in *Standard Methods for the Examination of Water and Wastewater*, latest edition. As a minimum, compliance with this objective as stated in the previous sentence shall be evaluated with a 96-hour bioassay.

In addition, effluent limits based upon acute biotoxicity tests of effluents will be prescribed where appropriate; additional numerical receiving water quality objectives for specific toxicants will be established as sufficient data become available; and source control of toxic substances will be encouraged.

3.1.21 Turbidity

Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits:

- Where natural turbidity is less than 1 Nephelometric Turbidity Unit (NTU), controllable factors shall not cause downstream turbidity to exceed 2
- Where natural turbidity is between 1 and 5 NTUs, increases shall not exceed 1 NTU.
- Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent.
- Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs.
- Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.

In determining compliance with the above limits, appropriate averaging periods may be applied provided that beneficial uses will be fully protected.

Exceptions to the above limits will be considered when a dredging operation can cause an increase in turbidity. In those cases, an allowable zone of dilution within which turbidity in excess of the limits may be tolerated will be defined for the operation and prescribed in a discharge permit.

For Folsom Lake (50) and American River (Folsom Dam to Sacramento River) (51), except for periods of storm runoff, the turbidity shall be less than or equal 10 NTUs. To the extent of any conflict with the general turbidity objective, the more stringent applies.

For Delta waters, the general objectives for turbidity apply subject to the following: except for periods of storm runoff, the turbidity of Delta waters shall not exceed 50 NTUs in the waters of the Central Delta and 150 NTUs in other Delta waters. Exceptions to the Delta specific objectives will be considered when a dredging operation can cause an increase in turbidity. In this case, an allowable zone of dilution within which turbidity in excess of limits can be tolerated will be defined for the operation and prescribed in a discharge permit.

For Deer Creek, source to Cosumnes River:

- When the dilution ratio for discharges is less than 20:1 and where natural turbidity is less than 1 Nephelometric Turbidity Unit (NTU), discharges shall not cause the receiving water daily average turbidity to exceed 2 NTUs or daily maximum turbidity to exceed 5 NTUs. Where natural turbidity is between 1 and 5 NTUs, dischargers shall not cause receiving water daily average turbidity to increase more than 1 NTU or daily maximum turbidity to exceed 5 NTUs
- Where discharge dilution ratio is 20:1 or greater, or where natural turbidity is greater than 5 NTUs, the general turbidity objectives shall apply.

3.2 WATER QUALITY OBJECTIVES FOR GROUND WATERS

The following objectives apply to all ground waters of the Sacramento and San Joaquin River Basins, as the objectives are relevant to the protection of designated beneficial uses. These objectives do not require improvement over naturally occurring background concentrations. The ground water objectives contained in this plan are not required by the federal Clean Water Act.

3.2.1 Bacteria

In ground waters used for domestic or municipal supply (MUN) the most probable number of coliform organisms over any seven-day period shall be less than 2.2/100 ml.

3.2.2 Chemical Constituents

Ground waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses.

At a minimum, ground waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs) specified in the following provisions of Title 22 of the California Code of Regulations, which are incorporated by reference into this plan: Tables 64431-A (Inorganic Chemicals) and 64431-B (Fluoride) of Section 64431, Table 64444-A (Organic Chemicals) of Section 64444, and Tables 64449-A (Secondary Maximum Contaminant Levels- Consumer Acceptance Limits) and 64449-B (Secondary Maximum Contaminant Levels-Ranges) of Section 64449. This incorporation-by-reference is prospective, including future changes to the incorporated provisions as the changes take effect. At a minimum, water designated for use as domestic or municipal supply (MUN) shall not contain lead in excess of 0.015 mg/l. To protect all beneficial uses, the Regional Water Board may apply limits more stringent than MCLs.

3.2.3 Radioactivity

At a minimum, ground waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of radionuclides in excess of the maximum contaminant levels (MCLs) specified in Table 4 (MCL Radioactivity) of Section 64443 of Title 22 of the California Code of Regulations, which are incorporated by reference into this plan. This incorporation-by-reference is prospective, including future changes to the incorporated provisions as the changes take effect.

3.2.4 Tastes and Odors

Ground waters shall not contain taste- or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses.

3.2.5 Toxicity

Ground waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life associated with designated beneficial use(s). This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances.

4 IMPLEMENTATION

The Porter-Cologne Water Quality Control Act states that basin plans consist of beneficial uses, water quality objectives and a program of implementation for achieving their water quality objectives [Water Code Section 13050(j)]. The implementation program shall include, but not be limited to:

- (1) A description of the nature of actions which are necessary to achieve the objectives, including recommendations for appropriate action by any entity, public or private;
- (2) A time schedule for the actions to be taken; and,
- (3) A description of surveillance to be undertaken to determine compliance with the objectives (Water Code Section 13242).

In addition, State law requires that basin plans indicate estimates of the total cost and identify potential sources of funding of any agricultural water quality control program prior to its implementation. (Water Code Section 13141). This chapter of the Basin Plan responds to all but the surveillance requirement. That is described in Chapter 5.

This chapter is organized as follows: The first section contains a general description of water quality concerns. These are organized by discharger type (e.g., agriculture, silviculture, mines, etc.). The second section lists programs, plans and policies which should result in the achievement of most of the water quality objectives in this plan. This section includes descriptions of State Water Board policies, statewide plans, statewide programs dealing with specific waste discharge problems (e.g., underground tanks, storm water, solid waste disposal sites, etc.), memoranda of understanding, management agency agreements, memoranda of agreement, Regional Water Board policies, a listing of Regional Water Board prohibition areas, and Regional Water Board guidelines addressing specific water quality problems. The third section contains recommendations for appropriate action by entities other than the Regional Water Board. The fourth section describes how; within the framework of the programs, plans and policies discussed in the second section; the Regional Water Board integrates water quality control activities into a continuing planning process. The fifth section identifies the current actions and the time schedule for future actions of the Regional Water Board to achieve compliance with water quality objectives where the programs, plans and policies in the second section are not adequate. The last section lists the estimated costs and funding sources for agricultural water quality control programs that are implemented by the Regional Water Board.

4.1 WATER QUALITY CONCERNS

Water quality concerns are existing or potential water quality problems, i.e., impairments of beneficial uses or degradations of water quality. At any given time, water quality problems generally reflect the intensity of activities of key discharge sources and the volume, quality, and uses of the receiving waters affected by the discharges.

Historic and ongoing point and nonpoint source discharges impact surface waters. Significant portions of major rivers and the Delta are impaired, to some degree, by discharges from agriculture, mines, urban areas and industries. Upstream, small streams and tributaries to the Rivers are impaired or threatened because of discharges from mines, silviculture activities, and urban development activities. Control approaches may differ depending on the source of the problem.

A variety of historic and ongoing point and non-point industrial, urban, and agricultural activities degrade the quality of ground water. Discharges to ground water associated with these activities include industrial and agricultural chemical use and spills; underground and above ground tank and sump leaks; landfill leachate and gas releases; septic tank failures; improper animal waste management; and chemical seepage via shallow drainage wells and abandoned wells. The resulting impacts on ground water quality from these discharges are often long-term and costly to treat or remediate. Consequently, as discharges are identified, containment and cleanup of source areas and plumes must be undertaken as quickly as possible. Furthermore, activities that may potentially impact ground water must be managed to ensure that ground water quality is protected.

Improper management of waste materials and spillage of industrial fluids have degraded or polluted ground water resources beneath military bases, rail yards, wood treating facilities, aerospace manufacturing and testing operations, municipal gas plants, fuel tank farms, pesticide formulators, dry cleaners, and other industrial facilities. Many of the sites contain high concentrations of contaminants in soils, which continue to be sources of ground water degradation and pollution, until remediated.

Our knowledge of amounts and types of problems associated with discharge activities change over time. Early federal and state control efforts tended to focus on the most understood or visible problems such as the discharge of raw sewage to rivers and streams. As these problems were controlled and as pollutant detection and measurement methods improved, regulatory emphasis shifted. For example, control of toxic discharges is now a major concern. Toxicity can be associated with many discharge activities. Its effects may be first expressed as acute or chronic reductions in the number of organisms in receiving waters. Minute amounts of toxic materials may also impair beneficial uses from accumulation in tissues or sediments.

Discharges are sometimes sorted into point source and nonpoint source categories. A point source discharge usually refers to waste emanating from a single, identifiable place. A nonpoint source discharge usually refers to waste emanating from diffused locations. The Regional Water Board may control either type of discharge, but the control approaches may differ.

Salt management is becoming increasingly important in the San Joaquin Valley for urban and agricultural interests. If current practices for discharging waters containing elevated levels of salt continue unabated, the San Joaquin Valley can have a large portion of its ground water severely degraded within a few decades. Therefore, the Regional Water Board will pursue strategies that will achieve the availability of a valley-wide drain for the discharge of agricultural wastewaters and drain waters degraded by elevated levels of salt and in which nutrient and toxic material concentrations meet applicable standards.

Following is a brief description of the water quality impacts associated with basin discharge activities along with some general control considerations.

4.1.1 Agriculture

Agricultural activities affect water quality in a number of ways. There are unique problems associated with irrigated agriculture, agricultural support activities, and animal confinement operations because of the volume of water used and the diffused nature of many of the discharges.

4.1.1.1 Irrigated Agriculture

Irrigated agriculture accounts for most water use in the two sub-basins. Both the San Joaquin and the Sacramento Rivers carry substantial amounts of agricultural return water or drainage. Agricultural drainage contributes salts, nutrients, pesticides, trace elements, sediments, and other by-products that affect the water quality of the rivers and the Delta.

There is a Memorandum of Understanding between the State Water Board and Department of Pesticide Regulation describing the role of each agency with regard to pesticide regulation.

Salt management is critical to agriculture in the Central Valley. Evaporation and crop transpiration remove water from soils which can result in an accumulation of salts in the root zone of the soils at levels that retard or inhibit plant growth. Additional amounts of water often are applied to leach the salts below the root zones. The leached salts can reach ground or surface water. The movement of the salts to surface waters may be a natural occurrence of subsurface flows or it can result from the surface water discharge of subsurface collection systems (often called tile drains) which are routinely employed in areas of the Central Valley where farm lands have poor drainage capabilities. The tile drainage practice consists of installing collection systems below the root zone of the crops to drain soils that would otherwise stay saturated because of subsurface conditions that restrict drainage. Tile drain installation may result in TDS concentrations in drainage water many times greater than in the irrigation water that was applied to the crops. Tile drain water can also contain pesticides, trace elements, and nutrients.

Pesticides and nutrients are also major ingredients of surface agricultural drainage. They have found their way to ground and surface waters in many areas of the basins. Fish and aquatic wildlife deaths attributable to pesticide contamination of surface water occur periodically.

Nitrate and DBCP (1,2-Dibromo-3-chloropropane) levels exceeding the State drinking water standards occur extensively in ground water in the basins and public and domestic supply wells have been closed because of DBCP, EDB, nitrates, and other contaminants in several locations.

Discharge of sediment is another problem encountered with agriculture. Sedimentation impairs fisheries and, by virtue of the characteristics of many organic and inorganic compounds to bind to soil particles, it serves to distribute and circulate toxic substances through the riparian, estuarine, and marine systems. Sedimentation also increases the costs of pumping and treating water for municipal and industrial use. An additional significant impact of sediment in runoff is the sediment's direct smothering effect on bottom dwelling communities.

The Regional Water Board approaches problems related to irrigated agriculture as it does other categories of problems. Staff are assigned to identify and evaluate beneficial use impairments associated with agricultural discharges. Control actions are developed and implemented as appropriate per the schedules identified through the continuous planning process (see section titled, "ACTIONS AND SCHEDULE TO ACHIEVE WATER QUALITY OBJECTIVES").

4.1.1.2 Agricultural Support Activities

These are the activities associated with the application of pesticides, disposal of pesticide rinse waters, and formulation of pesticides and fertilizers. Major water quality problems connected with all of these operations stem from the discharge of waters used to clean equipment or work areas. The Region has confirmed cases of ground water contamination as a result of improper containment and disposal of rinse water.

Many of the application facilities fall under Regional Water Board regulatory programs. When appropriate, best management practices are recommended. Regional Water Board staff also inspects high risk sites to evaluate compliance. Enforcement strategies are implemented as warranted.

4.1.1.3 Animal Confinement Operations

Runoff from animal confinement facilities (e.g., stockyards, dairies, poultry ranches) can impair both surface and ground water beneficial uses. The animal wastes may produce significant amounts of coliform, ammonia, nitrate, and TDS contamination. The greatest potential for water quality problems has historically stemmed from the overloading of the facilities' waste containment and treatment ponds during the rainy season and inappropriate application of wastewater and manure. Most of these facilities are not operating under waste discharge requirements (WDRs). However, waste management at all confined animal facilities must comply with specific regulations and large facilities must obtain an NPDES storm water permit.

4.1.2 Silviculture

Forest management activities, principally timber harvesting and application of herbicides, have the potential to impact beneficial uses. Timber harvest activities annually take place on tens of thousands of acres of private and federal land in the Central Valley Region and they may affect water quality throughout the area being harvested. Erosion can result from road construction, logging, and post-logging operations. Logging debris may be deposited in streams. Landslides and other mass soil movements can also occur as a result of timber operations.

Herbicides may be used in silviculture to reduce commercial timber competition from weeds, grasses, and other plants or to prepare a site for planting of commercial species by eliminating existing vegetation. Use of herbicides has caused concern among regulatory agencies and the public because of the possibility of transport from target sites to streams by wind and water runoff.

The State and Regional Water Boards entered into agreements with both the U.S. Forest Service and the California Department of Forestry and Fire Protection which require these agencies to control nonpoint source discharges by implementing control actions certified by the State Water Board as best management practices (BMPs). The Regional Water Board enforces compliance with BMP implementation and may impose control actions above and beyond what is specified in the agreements if the practices are not applied correctly or do not protect water quality. Point source discharges on federal and state and private forest lands are regulated through waste discharge limits.

4.1.3 Municipalities and Industries

Municipal and industrial point source discharges to surface waters are generally controlled through National Pollutant Discharge Elimination System (NPDES) permits. Although the NPDES program was established by the Clean Water Act, the permits are prepared and enforced by the Regional Water Boards per California's authority for the Act. The number of cases of ground water pollution attributable to industrial or municipal sources has increased steadily. For example, the Region's inventory of underground storage tanks indicates the number of leaking tanks is high. Ground water contamination from other industrial sources generally occurs from practices of disposing of fluids or other materials used in production processes. Waste compounds have been discharged directly to unlined sumps, pits, or depressions and spread on soils. In some cases, these disposal practices went on many years before they were discovered or discontinued. Leaking municipal or industrial sewer lines also contribute to ground water pollution.

The promulgation of EPA sludge regulations under section 503 of the Clean Water Act and the adoption of water quality objectives for toxic pollutants pursuant to section 303(c)(2)(B) will require that NPDES permits, upon renewal, be updated to reflect these new regulations. Once effluent limitations sufficient to comply with sludge requirements and water quality objectives for toxic pollutants have been placed into NPDES permits, POTWs subject to pretreatment program requirements will be required to update their local limits consistent with EPA pretreatment program regulations and guidance.

4.1.4 Storm Water

Runoff from residential and industrial areas also contributes to water quality degradation. Urban storm water runoff contains pesticides, oil, grease, heavy metals, polynuclear aromatic hydrocarbons, other organics, and nutrients. Because these pollutants accumulate during the dry summer months, the first major autumn storm can flush a highly concentrated load to receiving waters and catch basins. Combined storm and sanitary systems may result in some runoff to sewage treatment plants. In other cases, storm water collection wells can produce direct discharges to ground water. Impacts of storm water contaminants on surface and ground waters are an important concern.

The "Control Action Considerations of the State Water Board" section in Chapter 4 provides more detail on how the Regional Water Board regulates storm water.

4.1.5 Mineral Exploration and Extraction

Mineral exploration and extraction discharges are associated with several ore, geothermal, and petroleum/natural gas activities. The discharge of greatest concern in the Sacramento and San Joaquin River Basins is the result of ore exploration and extraction.

Drainage and runoff from mines and various operations associated with mining can result in serious impacts to ground and surface water beneficial uses, if not properly managed. Along much of the east side of the Coast Range, runoff, drainage, and erosion from old mercury mines is a problem that has resulted in high levels of mercury in aquatic environments and fish tissue. There are also major metal and acid discharges associated with abandoned copper mines in the Sierra/ Cascades drainages. Sedimentation can be a problem in the construction and operation of many mines.

Within the past decade there has been a significant increase in the amount of gold extraction and processing in the Sierra foothills and in the Coast Ranges. Most of these operations have been made possible by advances in technology, permitting the economical extraction of minute quantities of gold from large volumes of ore with the use of cyanide and other reagents by heap and vat leach methods, and by the current high price of gold on world markets. Advances in ore and waste rock handling techniques have made open pit mining more profitable and common. These mining operations involve the handling and management of large quantities of ore, potentially-toxic chemical reagents, tailings, waste rock, and spent leaching solutions in piles, tailings ponds, and impoundments. If not carefully managed, these operations have the potential to leach toxic reagents, heavy metals, salts, and acidic drainage waters into surface and ground water resources. Mining waste management facilities and associated mining operations are regulated through the issuance of waste discharger requirements under the State and Regional Water Boards' hazardous and solid waste regulatory program (Title 23, California Code of Regulations (CCR), Division 3, Chapter 15 and Title 27, CCR, Division 2, Subdivision 1).

Efforts to control drainage have gradually expanded over the years. Staff assessments of mine water quality problems done in 1979 and 1992 helped direct the Regional Water Board's approach to the problems. When other options were exhausted, the Regional Water Board has used public funds to abate pollution from these mines.

Geothermal operations in the basins are centered in the Geysers Area of Lake County. Potential impacts to water quality are caused by soil erosion from road construction and site preparation, high pressure steam blowouts, and accidental spills of materials from drilling operations, power plants, steam condensate lines, and waste transport accidents. Bentonite clay, boron, ammonia, sodium hydroxide, sulfur compounds, heavy metals, and petroleum products are found in various concentrations in mud sumps, steam condensate lines, and sulfide abatement sludge. Operational failures can release these substances into waterways.

4.1.6 Hazardous and Non-Hazardous Waste Disposal

Discharges of solid, semi-solid, and liquid wastes to landfills, waste piles, surface impoundments, pits, trenches, tailings ponds, natural depressions and land treatment facilities (collectively called "waste management units") have the potential to create sources of pollution affecting the quality of waters of the State. Unlike surface waters which often have the capacity to assimilate discharged waste constituents, ground waters have little or no assimilative capacity, due to their slow migration rate, lack of aeration, lower biological activity, and laminar flow patterns. If the concentrations of constituents in the land-discharged waste are sufficiently high to prevent the waste from being classified as "inert waste" under 27 CCR, Section 20230, discharges of such wastes to waste management units require long term containment or active treatment following the discharge in order to prevent waste or waste constituents from migrating to and impairing the beneficial uses of waters of the State. Pollutants from such discharges may continue to affect water quality long after the discharge of new waste to the unit has ceased, either because of continued leachate or gas discharges from the unit, or because pollutants have accumulated in underlying soils from which they are gradually released to ground water.

Landfills for disposal of municipal or industrial solid waste (solid waste disposal sites) are the major categories of waste management units in the region, but there are also surface impoundments used for storage or evaporative treatment of liquid wastes, waste piles for the storage of solid wastes, and land treatment units for the biological treatment of semi-solid sludges from wastewater treatment facilities and liquid wastes from cannery and other industrial operations. Sumps, trenches, and soil depressions have been used in the past for liquid waste disposal. Mining waste management units (tailings ponds, surface impoundments, and waste piles) also represent a significant portion of the waste management units in the Region. The Regional Water Board issues waste discharge requirements to ensure that these discharges are properly contained to protect the Region's water resources from degradation, and to ensure that dischargers undertake effective monitoring to verify continued compliance with requirements.

These discharges, and the waste management units at which the wastes are discharged, are subject to concurrent regulation by other State and local agencies responsible for land use planning, solid waste management, and hazardous waste management. "Local Enforcement Agencies" (mainly cities and counties) implement the State's solid waste management laws and local ordinances governing the siting, design, and operation of solid waste disposal facilities (usually landfills) with the concurrence of the California Integrated Waste Management Board (CIWMB). The CIWMB also has direct responsibility for review and approval of plans for closure and post-closure maintenance of solid waste landfills. The Department of Toxic Substance Control (DTSC) issues permits for all hazardous waste treatment, storage, and disposal facilities (which include hazardous waste incinerators, tanks, and warehouses where hazardous wastes are stored in drums as well as landfills, waste piles, surface impoundments, and land treatment units). The State Water Board, Regional Water Boards, CIWMB, and DTSC have entered into a Memoranda of Understanding to coordinate their respective roles in the concurrent regulation of these discharges. In addition, the Toxic Pits Cleanup Act of 1984 precludes the storage or disposal of liquid hazardous wastes or hazardous wastes containing free liquids. The Regional Water Board is responsible for enforcing this Act under the authority of the Health and Safety Code, Section 25208 et seq. (See section 4.2.1.2.3 for further description).

The statutes and regulations governing the discharges of both hazardous and non-hazardous wastes have been revised and strengthened in the last few years. The discharge of municipal solid wastes to land are closely regulated and monitored; however, some water quality problems have been detected and are being addressed. Recent monitoring efforts under the State and Regional Water Boards' Title 23, CCR Division 3, Chapter 15; Title 27 CCR, Division 2, Subdivision 1; and SWAT programs have revealed that discharges of municipal solid wastes to unlined and single clay lined landfills have resulted in ground water degradation and pollution by volatile organic constituents (VOCs) and other waste constituents. VOCs are components of many household hazardous wastes and certain industrial wastes that are present within municipal solid waste streams. VOCs can easily migrate from landfills either in leachate or by vapor-phase transport. Clay liners and natural clay formations between discharged wastes and ground waters are largely ineffective in preventing water quality impacts from municipal solid waste constituents. In a recently adopted policy for water quality control, the State Water Board found that "[r]esearch on liner systems for landfills indicates that (a) single clay liners will only delay, rather than preclude, the onset of leachate leakage, and (b) the use of composite liners represents the most effective approach for reliably containing leachate and landfill gas" (State Water Board Resolution No. 93-62, *Policy for Regulation of Discharges of Municipal Solid Waste*).

As a result of similar information on a national scale, the U.S. Environmental Protection Agency (USEPA) has adopted new regulations under Subtitle D of the Resource Conservation and Recovery Act (RCRA) which require the containment of municipal solid wastes by composite liners and leachate collection systems. Composite liners consist of a flexible synthetic membrane component placed above and in intimate contact with a compacted low-permeability soil component. This liner system enhances the effectiveness of the leachate collection and removal system and provides a barrier to vapor-phase transport of VOCs from the unit. Regional Water Boards and the CIWMB are implementing these new regulations in California under a policy for water quality control from the State Water Board (Resolution No. 93-62, discussed above) and new regulations from CIWMB. While a single composite liner of the type that can be approved under Subtitle D regulations is a significant improvement over past municipal solid waste containment systems, it should be noted, however, that single composite liners will not necessarily provide complete protection for ground water resources.

4.1.7 Contaminated Sites Threatening Ground Water Quality

The Regional Water Board has identified over 7000 sites with confirmed releases of constituents of concern which have adversely impacted or threaten to impact the quality of ground water resources. Sources of pollution at these sites include: leaking underground storage tanks and sumps; leaking above ground tanks; leaking pipelines; leaking waste management units, such as landfills, disposal pits, trenches and ponds; surface spills from chemical handling, transfer or storage; poor housekeeping; and illegal disposal. A policy for investigation and cleanup of such sites is contained in the section of this chapter titled "Policy for Investigation and Cleanup of Contaminated Sites."

4.1.8 Drinking Water Policy

The Regional Water Board supports protection of the MUN beneficial use in surface waters of the Sacramento-San Joaquin Delta and its tributaries. The Delta provides drinking water to over 25 million people in the Southern California, Central Valley, Central Coast, and San Francisco Bay regions, and several million people obtain their water supply from the tributaries of the Delta. The tributaries of the Sacramento and San Joaquin Rivers that originate in the Cascades and Sierra Nevada Mountains generally have high water quality. However, as the tributaries flow into lower elevations, they are affected by natural processes, urban, industrial, and agricultural land uses, and a highly managed water supply system. This Policy pertains to the

following drinking water constituents of concern: organic carbon, *Cryptosporidium*, *Giardia*, salt and nutrients. Work on the Policy was initiated in 2000 in response to concerns that these constituents might pose significant drinking water risks and result in significant additional treatment costs for water agencies due to the potential increased loading as a result of population growth in the watershed. Source control evaluations conducted in 2011 show that the load of organic carbon and nutrients will not likely increase in the future as a result of current regulatory actions. Monitoring of *Cryptosporidium* at public water system intakes from 2006 to 2011, as required by USEPA regulations, has not resulted in additional treatment requirements for public water systems treating water from the Delta and its tributaries. The *Cryptosporidium* and *Giardia* narrative objective and associated implementation program are to maintain existing conditions for public water systems, to comply with the Policy with Respect to Maintaining High Quality of Water in California and the Antidegradation Implementation Policy.

Other elements of the Drinking Water Policy include the following:

- The Basin Plan contains the following elements that address the protection of the MUN beneficial use:
 - All water quality objectives are developed to protect the MUN beneficial use unless otherwise stated. The Basin Plan also includes specific narrative and numeric objectives to protect the MUN beneficial use.
 - The existing narrative water quality objective for chemical constituents includes drinking water chemical constituents of concern, such as organic carbon.
 - The Implementation Chapter of the Basin Plan contains the following Policies relevant to the protection of the MUN beneficial use:
 - Resolution No. 68-16, Policy with Respect to Maintaining High Quality of Water in California (Section 4.2.1.1.2).
 - Resolution No. 88-63, Sources of Drinking Water Policy (Section 4.2.1.1.8).
 - Antidegradation Implementation Policy (Section 4.2.2.1.7).
 - Policy for Application of Water Quality Objectives (Section 4.2.2.1.9).
 - Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California; a.k.a. State Implementation Plan or SIP (Section 4.2.1.1.15)
 - Continued coordinated monitoring and modeling of the identified drinking water constituents of concern is necessary to confirm that concentrations will not likely increase to levels that adversely affect beneficial uses. Monitoring completed to support the implementation of the Drinking Water Policy shall be coordinated with other monitoring programs already in place as well as the Delta Regional Monitoring Program. The Delta Regional Monitoring Program is a Regional Water Board initiated stakeholder effort to address the need for a comprehensive monitoring, assessment and reporting program.
- To further protect the public health, drinking water utilities employ a multibarrier approach to control contaminants that includes source water protection, water treatment, and protection of distribution system water quality.
- Source evaluations based on 2011 permit conditions for publically owned treatment works, urban runoff, and irrigated agriculture, indicate that concentrations of organic carbon at public water system intakes are not expected to increase over time.
- Drinking water constituents of concern shall continue to be considered when NPDES facilities conduct their Antidegradation analysis.

- If there are significant changes to the characteristics of the project area, drinking water treatment standards based on source water quality, or knowledge regarding drinking water constituents of concern, the Central Valley Water Board may consider the need to reevaluate the Drinking Water Policy. The Drinking Water Policy will be reviewed by the Regional Water Board in 2023 to determine if the provisions should be revised.
- The Regional Water Board supports and recognizes the importance of USEPA's efforts to refine analytical methods to measure *Cryptosporidium* and *Giardia* in water.
- The Regional Water Board supports refinement of analytical modeling efforts to improve understanding of the fate and transport of drinking water constituents of concern.
- It is appropriate to use *Cryptosporidium* concentrations as an indicator of compliance with the *Cryptosporidium* and *Giardia* objective since *Cryptosporidium* is not as readily treated as *Giardia* when conventional drinking water treatment processes are employed, and USEPA promulgated new drinking water requirements specifically to address *Cryptosporidium*.

4.1.9 Other Discharge Activities

Some remaining discharges of major concern include sedimentation from land development activities in the foothills and mountains, leachate from septic tank/individual wastewater disposal systems, and dredging and dredging spoils runoff.

Many of the foothill/mountain counties in the sub-basins face high growth rates. Sedimentation from the land disturbances associated with residential and commercial development is an increasing problem that, when added to the sedimentation resulting from farming and silvicultural operation, may require establishment of a region-wide erosion control program. The Regional Water Board's current practice is to emphasize local government control of erosion caused by residential development. Erosion control guidelines are included in the erosion/sedimentation action plan which is in the Appendix.

Improperly located, designed, constructed and/or maintained on-site wastewater treatment and disposal systems can result in ground and surface water degradation and public health hazards. The Regional Water Board's approach is that the control of individual wastewater treatment and disposal systems is best accomplished by local environmental health departments enforcing county ordinances designed to provide protection to ground and surface waters. Consistent with this approach, the Regional Water Board implements the State Water Board's *Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems* (OWTS Policy).

The energy crisis of the 1970s resulted in a surge of small hydroelectric facility development in the mountains and foothills. Impairments to beneficial uses may occur because of erosion from construction and changes in water temperature. The Regional Water Board has published guidelines for small hydro-electric facilities (see Guidelines section of this chapter and Appendix) to help address some of the problems associated with small hydroelectric plants.

Dredging is a problem because the process can result in turbidity and the reintroduction and resuspension of harmful metal or organic materials. This latter effect occurs directly as a result of the displacement of sediment at the dredging site and indirectly as a result of erosion of dredge spoil to surface waters at the deposition site. Another major concern is water quality problems associated with the dredge spoils disposal site. There is much dredging of the Sacramento and San Joaquin Rivers and the Delta because of the need to maintain the ship channels to the Ports of Sacramento and Stockton. The Regional Water Board regulates

dredging operations on a case-by-case basis. Operational criteria may result from permits or the water quality certification requirements stemming from Section 401(a) of the Clean Water Act.

In addition to the problems described above, the Regional Water Board responds to spontaneous discharges such as spills, leaks and overflows. These can have cumulatively or individually significant effects on beneficial uses of ground and surface waters.

4.1.10 Water Bodies with Special Water Quality Problems

Water quality management may require the identification and ranking of water bodies with regard to certain quality parameters. Water Quality Limited Segments (WQLSs) are one example of expressing water quality problems by water bodies. WQLSs are those sections of lakes, streams, rivers or other fresh water bodies where water quality does not meet (or is not expected to meet) water quality standards even after the application of appropriate effluent limitations for point sources (40 CFR 130, et seq.).

Additional treatment beyond minimum federal requirements will be imposed on dischargers to WQLSs. Dischargers will be assigned or allocated a maximum allowable load of critical pollutants so that water quality objectives can be met in the segment.

The Regional Water Board's list of WQLSs is updated biennially as required by Clean Water Act Section 303(d). The current list may be obtained by contacting the Regional Water Board office.

4.2 THE NATURE OF CONTROL ACTIONS IMPLEMENTED BY THE REGIONAL WATER BOARD

The nature of actions to achieve water quality objectives consists of Regional Water Board efforts:

- (1) to identify potential water quality problems;
- (2) to confirm and characterize water quality problems through assessments for source, frequency, duration, extent, fate, and severity;
- (3) to remedy water quality problems through imposing or enforcing appropriate measures; and
- (4) to monitor problem areas to assess effectiveness of the remedial measures.

Generally, the actions associated with the first step consist of surveys or reviews of survey information and other data sources to isolate possible impairments of beneficial uses or water quality.

The characterization step usually involves studies that attempt to answer questions about a water quality problem's source, extent, duration, frequency, and severity. Information on these parameters is essential to confirm a problem and prepare for remedy. The Regional Water Board may gain this information through its own work or through data submittals requested of actual or potential dischargers under Section 13267 of the California Water Code.

Problem remedy calls for the Regional Water Board to prevent or clean up problems. A common means of prevention is through the issuance of National Pollutant Discharge Elimination System (NPDES) permits, waste discharge requirements (WDRs), discharge prohibitions, and other discharge restrictions. Cleanup is implemented through enforcement measures such as Cease and Desist (C&D) and Cleanup and Abatement (C&A) orders. The NPDES is a requirement of

the Federal Clean Water Act (Section 402) and California has implementing responsibility. The national permit system only applies to certain surface water discharges. WDRs, which encompass permits, are called for by State law, Water Code Section 13260, et seq. The WDRs system is not as restricted as the Federal NPDES. As practical, WDRs may be used to control any type of discharge to ground or surface waters. C&D and C&A orders are two of the enforcement tools available to the Regional Water Board to correct actual or potential violations of WDRs, NPDES permits, prohibitions, and other water quality control obligations.

The details of the monitoring step are explained in Chapter 5. In general, the Regional Water Board has wide latitude to require actual and potential dischargers to submit monitoring and surveillance information, in addition to using State Water Board data or collecting its own.

Whatever actions the Regional Water Board implements must be consistent with the Basin Plan's beneficial uses and water quality objectives, as well as certain State and Regional Water Boards' policies, plans, agreements, prohibitions, guidance, and other restrictions or requirements. These considerations are described below and included in the Appendix when noted.

4.2.1 Control Action Considerations of the State Water Board

4.2.1.1 Policies and Plans

The State Water Board adopts water quality control policies and water quality control plans to which Regional Water Board actions must conform. Sections 13146 and 13247 of the California Water Code generally require that, in carrying out activities which affect water quality, all state agencies, departments, boards and offices must comply with all policies for water quality control and with applicable water quality control plans approved or adopted by the State Water Board. Two of the plans, the Ocean Plan and the Tahoe Plan, do not affect the Sacramento and San Joaquin River Basins. The policies and plans that are applicable are described below.

4.2.1.1.1 The State Policy for Water Quality Control

This policy declares the State Water Board's intent to protect water quality through the implementation of water resources management programs and serves as the general basis for subsequent water quality control policies. The policy was adopted by the State Water Board in 1972. See Appendix Item 1.

4.2.1.1.2 State Water Board Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality of Water in California

The State Water Board adopted this policy on 28 October 1968. The policy generally restricts the Regional Water Board and dischargers from reducing the water quality of surface or ground waters even though such a reduction in water quality might still allow the protection of the beneficial uses associated with the water prior to the quality reduction. The goal of the policy is to maintain high quality waters.

Changes in water quality are allowed only if the change is consistent with maximum benefit to the people of the State; does not unreasonably affect present and anticipated beneficial uses; and, does not result in water quality less than that prescribed in water quality control plans or policies.

USEPA water quality standards regulations require each state to adopt an "antidegradation" policy and specify the minimum requirements for the policy (40 CFR 131.12). The State Water Board has interpreted State Water Board Resolution No. 68-16 to incorporate the federal

antidegradation policy. The Regional Water Board implements Resolution No. 68-16 consistent with the federal antidegradation policy where the federal regulations apply. Resolution No. 68-16 applies to both ground and surface waters of the state. Resolution No. 68-16 is Appendix Item 2; the federal policy is Appendix Item 39.

4.2.1.1.3 *State Water Board Resolution No. 74-43, The Water Quality Control Policy for the Enclosed Bays and Estuaries of California*

This policy was adopted by the State Water Board on 16 May 1974 and provides water quality principles and guidelines for the prevention of water quality degradation in enclosed bays and estuaries to protect the beneficial uses of such waters. The Regional Water Board must enforce the policy and take actions consistent with its provisions. (This policy does not apply to wastes from boats or land runoff except as specifically indicated for siltation and combined sewer flows.) See Appendix Item 3.

4.2.1.1.4 *State Water Board Resolution No. 75-58, Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Powerplant Cooling*

This policy was adopted by the State Water Board in June 1975. Its purpose is to provide consistent principles and guidance for supplementary waste discharge requirements or other water quality control actions for thermal powerplants using inland waters for cooling. The Regional Water Board is responsible for its enforcement. See Appendix Item 4.

4.2.1.1.5 *State Water Board Resolution No. 77-1, Policy and Action Plan for Water Reclamation in California*

The policy was adopted 6 January 1977. Among other things, the policy requires the Regional Water Boards to conduct reclamation surveys and specifies reclamation actions to be implemented by the State and Regional Water Boards and other agencies. The policy and action plan are contained in the State Water Board report titled, *Policy and Action Plan for Water Reclamation in California*. See Appendix Item 5.

4.2.1.1.6 *State Water Board Resolution No. 87-22, Policy on the Disposal of Shredder Waste*

This State Water Board Resolution, adopted 19 March 1987, permits the disposal into certain landfills of wastes, produced by the mechanical destruction of car bodies, old appliances and similar castoffs, under specific conditions designated and enforced by the Regional Water Boards. See Appendix Item 6.

4.2.1.1.7 *State Water Board Resolution No. 88-23, Policy Regarding the Underground Storage Tanks Pilot Program*

The State Water Board adopted this policy on 18 February 1988. The policy implements a pilot program to fund oversight of remedial action at leaking underground storage tank sites, in cooperation with the California Department of Public Health (formerly the California Department of Health Services). Oversight may be deferred to the Regional Water Boards. See Appendix Item 7.

4.2.1.1.8 *State Water Board Resolution No. 88-63, Sources of Drinking Water Policy*

This policy for water quality control, adopted on 19 May 1988, is essential to the designation of beneficial uses. The policy specifies that, except under specifically defined exceptions, all surface and ground waters of the state are to be protected as existing or potential sources of

municipal and domestic supply. The specific exceptions include waters with existing high total dissolved solids concentrations (greater than 3000 mg/l), low sustainable yield (less than 200 gallons per day for a single well), waters with contamination that cannot be treated for domestic use using best management practices or best economically achievable treatment practices, waters within particular municipal, industrial and agricultural wastewater conveyance and holding facilities, and regulated geothermal ground waters. Where the Regional Water Board finds that one of the exceptions applies, it may remove the municipal and domestic supply beneficial use designation for the particular body of water through a formal Basin Plan amendment and a public hearing, followed by approval of such an amendment by the State Water Board and the Office of Administrative Law. See Appendix Item 8 for Resolution 88-63 exceptions and Appendix 44 for water bodies that meet one or more of the exceptions.

4.2.1.1.9 State Water Board Resolution No. 90-67, Pollutant Policy Document (PPD)

The PPD was adopted by the State Water Board in 1990, as part of their overall Delta water rights proceedings. The PPD establishes state policy for water quality control to be used by the San Francisco Bay Regional Water Board and the Central Valley Regional Water Board in updating basin plans. The PPD requires the Central Valley Regional Water Board to develop a mass emission strategy for limiting loads of heavy metals, PAHs and selenium entering the Delta. It also requires that specific actions be taken to eliminate the discharge of chlorinated dibenzodioxins and dibenzofurans to the Delta. The PPD describes other actions for controlling antifouling compounds used on boats and for regulating dredging.

4.2.1.1.10 State Water Board Resolution No. 92-49, Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304

This resolution contains policies and procedures for Regional Water Boards to follow for the oversight and regulation of investigations and cleanup and abatement activities from all types of discharge or threat of discharge subject to Section 13304 of the Water Code. It directs Regional Water Boards to ensure that dischargers are required to cleanup and to abate the effect of discharges. This cleanup and abatement shall be done in a manner that promotes attainment of background water quality, or the highest water quality which is reasonable if background levels of water quality cannot be restored. Any cleanup less stringent than background water quality shall be consistent with maximum benefit to the people of the state and not unreasonably affect present and anticipated beneficial uses of such water. See Appendix Item 9.

4.2.1.1.11 State Water Board Resolution No. 93-62, Policy for Regulation of Discharges of Municipal Solid Waste

The policy for water quality control, adopted by State Water Board on 17 June 1993, directs Regional Water Boards to amend waste discharge requirements for municipal solid waste landfills to incorporate pertinent provisions of the federal "Subtitle D" regulations under the Resource Conservation and Recovery Act (40 CFR Parts 257 & 258). The majority of the provisions of the Subtitle D regulations become effective on 9 October 1993. Landfills which are subject to the Subtitle D regulations and the Policy are those which have accepted municipal solid waste on or after 9 October 1991. See Appendix Item 10.

4.2.1.1.12 The Thermal Plan

The Water Quality Control Plan for the Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California was adopted by the State Water Board on 18 May 1972 and amended 18 September 1975. The plan specifies water quality objectives, effluent quality limits, and discharge prohibitions related to thermal characteristics of interstate

waters and waste discharges. See Appendix Item 11. (Note: the State Water Board adopted Resolution No. 92-82 on 22 October 1992, approving an exception to the Thermal Plan for Sacramento Regional County Sanitation District. See Appendix Item 12.)

4.2.1.1.13 The Delta Plan, Water Right Decision 1485, and the Water Quality Control Plan for Salinity

In August 1978, the State Water Board adopted the Delta Plan and Water Right Decision 1485 (D-1485). The Delta Plan contained water quality standards, Delta outflow requirements and export constraints for the Delta. These standards, requirements, and constraints were then implemented in D-1485 by making them conditions of the water right permits for the Central Valley Project and the State Water Project.

When the Delta Plan and accompanying D-1485 were originally issued, the State Water Board committed itself to review the Delta Plan in about ten years. In 1986, the State Court of Appeal issued a decision addressing legal challenges to the Delta Plan and D-1485. The Court directed the State Water Board to take a global view toward its dual responsibilities (water quality and water rights) to the State's water resources.

In response to the Court's decision, the State Water Board adopted the Water Quality Control Plan for Salinity in May 1991. The May 1991 Plan was superceded in May 1995 when the State Water Board adopted the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary. This Plan was revised in 2006. The State Water Board's Plan includes water quality objectives for salinity, temperature and dissolved oxygen that are applicable in the Delta.

In December 1999 the State Water Board adopted, and in March 2000 per Order WR 2000-02 revised, Water Right Decisions 1641. This decision amended certain water rights by assigning responsibilities to water right holders to help meet flow objectives intended to implement certain water quality objectives contained in the 1995 Bay-Delta Plan.

Rather than taking any water right action to meet the dissolved oxygen objectives in the 1995 Bay-Delta Plan, the State Water Board directed the Regional Water Board to first prepare a TMDL to achieve the dissolved oxygen objectives and implement it.

4.2.1.1.14 Nonpoint Source Management Plan and the Nonpoint Source Implementation and Enforcement Policy

In December 1999, the State Water Board, in its continuing efforts to control nonpoint source (NPS) pollution in California, adopted the Plan for California's Nonpoint Source Pollution Control Program (NPS Program Plan). The NPS Program Plan upgraded the State's first Nonpoint Source Management Plan adopted by the State Water Board in 1988 (1988 Plan). Upgrading the 1988 Plan with the NPS Program Plan brought the State into compliance with the requirements of Section 319 of the Clean Water Act and Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990.

The NPS Implementation and Enforcement Policy, adopted by the State Water Board on 20 May 2004 (State Water Board Resolution No. 2004-0030), explains how the Porter-Cologne Act mandates and authorities, delegated to the State Water Board and Regional Water Boards by the California Legislature, will be used to implement and enforce the NPS Program Plan. The policy also provides a bridge between the NPS Program Plan and the SWRCB Water Quality Enforcement Policy.

4.2.1.1.15 Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California” (a.k.a. State Implementation Policy or SIP)

The State Water Board adopted a policy that establishes:

- (1) Implementation provisions for priority pollutant criteria promulgated by the U.S. Environmental Protection Agency (U.S. EPA) through the National Toxics Rule (40 CFR 131.36) (promulgated on 22 December 1992 and amended on 4 May 1995) and through the California Toxics Rule (40 CFR 131.38) (promulgated on 18 May 2000 and amended on 13 February 2001), and for priority pollutant objectives established by Regional Water Boards in their basin plans; and
- (2) Monitoring requirements for 2,3,7,8-TCDD equivalents; and
- (3) Chronic toxicity control provisions.

In addition, the SIP includes special provisions for certain types of discharges and factors that could affect the application of other provisions in the SIP. The SIP, including future revisions, is incorporated into this Basin Plan and shall be implemented according to the policy’s provisions.

4.2.1.1.16 Water Quality Enforcement Policy (Enforcement Policy) and Policy on Supplemental Environmental Projects (SEP Policy)

The State Water Board adopted the Enforcement Policy to create a framework for identifying and investigating instances of noncompliance, for taking enforcement actions that are appropriate in relation to the nature and severity of the violation, and for prioritizing enforcement resources to achieve maximum environmental benefits. The State Water Board adopted the SEP Policy as an adjunct to the Water Boards’ enforcement program and allows for the inclusion of a supplemental environmental project in administrative civil liability actions as long as certain criteria are met to ensure that such a project has environmental value, furthers the goals of the State Water Board and Regional Water Boards, and are subject to appropriate input and oversight by the Water Boards. Both the Enforcement Policy and the SEP Policy, including future revisions, are incorporated into this Basin Plan and shall be implemented according to the policies’ provisions.

4.2.1.1.17 Water Quality Control Policy for Developing California’s Clean Water Act Section 303(d) List

Pursuant to California Water Code section 13191.3(a), this State policy for water quality control describes the process by which the State Water Board and the regional water boards will comply with the listing requirements of section 303(d) of the federal Clean Water Act. The objective of this policy is to establish a standardized approach for developing California’s section 303(d) list in order to achieve the overall goal of achieving water quality standards and maintaining beneficial uses in all of California’s surface waters.

4.2.1.1.18 Water Quality Control Policy for Addressing Impaired Waters: Regulatory Structure and Options

Section 303(d) of the Clean Water Act requires states to identify waters within their borders that are not attaining water quality standards. This State policy for water quality control describes the existing tools and mechanisms that the regional water boards will use to address the water bodies listed as impaired under section 303(d) of the federal Clean Water Act.

4.2.1.1.19 Policy for Compliance Schedules in National Pollutant Discharge Elimination System Permits

The Policy authorizes the Regional Water Board to include a compliance schedule in a permit for an existing discharger to implement a new, revised, or newly interpreted water quality objective or criterion in a water quality standard that results in a permit limitation more stringent than the limitation previously imposed.

4.2.1.1.20 Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems (OWTS Policy)

This Policy implements Water Code, Chapter 4.5, Division 7, sections 13290 through 13291.7 by establishing statewide regulations and standards for permitting onsite wastewater systems. The OWTS Policy specifies criteria for existing, replacement, and new onsite systems and establishes a conditional waiver of waste discharge requirements for onsite systems that comply with the policy. The OWTS Policy, including future revisions, is incorporated into this Basin Plan and shall be implemented according to the policy's provisions.

4.2.1.1.21 Policy for Water Quality Control for Recycled Water (Recycled Water Policy)

The Recycled Water Policy establishes requirements to increase the use of recycled water in California. These requirements include the development and adoption of salt/nutrient management plans, regulation of incidental runoff from landscape irrigation with recycled water, criteria and procedures for streamlined permitting of recycled water landscape irrigation projects, procedures for permitting groundwater recharge projects including procedures for demonstrating compliance with the Resolution No. 68-16 (the State Antidegradation Policy), and provisions for addressing constituents of emerging concern. The Recycled Water Policy, including future revisions, is incorporated into this Basin Plan and shall be implemented according to the policy's provisions.

4.2.1.2 Programs

4.2.1.2.1 Discharges of Hazardous Waste to Land, California Code of Regulations Title 23, Division 3, Chapter 15 and Consolidated Regulations for Treatment, Storage, Processing or Disposal of Solid Waste, California Code of Regulations Title 27, Division 2, Subdivision

Title 23, CCR, Division 3 Chapter 15 and Title 27 CCR, Division 2, Subdivision 1 includes regulations governing discharges of hazardous and solid waste to land for treatment, storage, or disposal. The regulations cover landfills, surface impoundments, waste piles, land treatment units, mining waste management units and confined animal facilities. In addition, actions to clean up and abate conditions of pollution or nuisance at contaminated sites are covered by relevant portions of the regulations where contaminated materials are taken off-site for treatment, storage, or disposal and, as feasible, where wastes are contained or remain on-site at the completion of cleanup actions. The regulations classify wastes according to their threat to water quality, classify waste management units according to the degree of protection that they provide for water quality, and provide siting, construction, monitoring, corrective action, closure and post closure maintenance criteria. Chapter 15 requirements are minimum standards for proper management of each waste category. These regulations require the complete containment of wastes which, if discharged to land for treatment, storage or disposal, have the potential to degrade the quality of water resources. Regional Water Boards may impose more stringent requirements to accommodate regional and site-specific conditions.

4.2.1.2.2 *Solid Waste Assessment Test (SWAT)*

Section 13273, added to the Water Code in 1985 (Assembly Bill 3525), required all owners of both active and inactive nonhazardous landfills to complete a Solid Waste Assessment (SWAT) to determine if hazardous waste constituents have migrated from the landfill into ground water. Pursuant to a list adopted by the State Water Board, 150 site owners statewide per year would complete this evaluation by 2001.

The Regional Water Board must review the SWAT report to determine whether any hazardous waste has migrated into ground water. If so, the Regional Water Board must notify the Department of Toxic Substances Control and the Integrated Waste Management Board, and take appropriate remedial action [CA Water Code Section 13273(e)].

4.2.1.2.3 *Toxic Pits Cleanup Act (TPCA)*

The Toxic Pits Cleanup Act of 1984 (Section 25208 et seq. of the Health and Safety Code) established a program to ensure that existing surface impoundments are either made safe or closed so that they do not pollute the waters of the state. The Act requires that all impoundments containing liquid hazardous wastes or hazardous wastes containing free liquids be retrofitted with a liner/leachate collection system, or closed by 1 July 1988. Surface impoundments containing hazardous wastes are prohibited within one-half mile upgradient from a potential source of drinking water. The law provided for certain exemptions.

4.2.1.2.4 *Underground Storage Tank (UST) Program*

The Central Valley UST Program is implemented under Division 20, Chapters 6.7 and 6.75 of the California Health and Safety Code and Title 23, Division 3, Chapter 16 of the California Code of Regulations. The program has two elements: leak prevention, which is implemented statewide by Local Implementing Agencies in 58 counties and 49 cities; and leak investigation and cleanup which is implemented by the Regional Water Board with assistance from the Local Implementing Agencies. Some Counties in the Central Valley Region are under contract with the State Water Board to provide investigation and cleanup oversight on some sites. These Counties are required to implement the requirements of the Basin Plan.

4.2.1.2.5 *Aboveground Petroleum Storage Act*

The Aboveground Petroleum Storage Act (Chapter 6.67, Division 20, Health and Safety Code) requires owners or operators of aboveground petroleum storage tanks to file a storage statement and pay a fee every two years (beginning 1 July 1990), to take specific actions to prevent spills, and, in certain instances, to implement a ground water monitoring program. Fees are used by staff to inspect facilities and review spill prevention plans. If a site is contaminated, staff oversee cleanup and the tank owner or operator is required to reimburse the Regional Water Board for reasonable costs for that oversight. There are approximately 8000 tank facilities in the region which have filed storage statements.

4.2.1.2.6 *Storm Water Regulations*

The 1987 Clean Water Act amendments required the USEPA to establish regulations to control storm water discharges associated with industrial activity; discharges from large (serving a population of 250,000 or more) and medium (serving a population of greater than 100,000 but less than 250,000) municipal separate storm sewer systems; and discharges from construction sites.

Federal regulations for storm water discharges were promulgated by the USEPA on 16 November 1990 (40 CFR Parts 122, 123, and 124). The regulations require large and medium size municipalities and specific categories of facilities, which discharge storm water associated with industrial activity, to obtain NPDES permits and to implement Best Available Technology Economically Achievable (BAT) and Best Conventional Pollutant Control Technology (BCT) to reduce or eliminate industrial storm water pollution. Municipal permits establish controls to reduce/eliminate pollutants to the maximum extent possible (MEP) and to effectively prohibit illicit discharges to storm sewer systems.

In 1991 (amended in 1992), the State Water Board adopted a statewide general NPDES permit (Order No. 91-13-DWQ, General Permit No. CAS000001) for storm water discharges associated with industrial activities. The Order applies to facilities which discharge storm water to surface waters, either directly or through a storm drain system, excluding construction activities.

The State Water Board also adopted a statewide general NPDES permit (Order No. 92-08-DWQ, General Permit No. CAS000002) in 1992, which applies to construction projects resulting in land disturbance of five acres or greater.

4.2.1.2.7 U.S. Department of Defense (DOD) Program

The State and Regional Water Board's DOD Program provides regulatory oversight for the restoration and protection of surface and ground water quality during environmental cleanup of military facilities listed in the DOD/State Memorandum of Agreement (DSMOA). The State Water Board will enter into an interagency agreement with the Department of Toxic Substances Control (DTSC) which, in turn, will enter into the DSMOA with DOD for cleanup oversight reimbursement. The State and Regional Water Boards provide regulatory oversight by their authority pursuant to Division 7 of the Water Code and Section 120(f) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Title 42, U.S.C., Section 9620 (f). The DOD enters into a two-year cooperative agreement with DTSC to support DTSC's mandated mission to protect public health and the environment. The DOD Program should continue until DSMOA facility cleanups are completed (20 to 30 years) or Congress decides to terminate State oversight funding.

The cleanup of military facilities is required to be consistent with the applicable provisions of CERCLA (Section 120 relating to Federal Facilities), the Superfund Amendments and Reauthorization Act of 1986 (SARA), the National Contingency Plan, and State laws.

4.2.1.3 State Water Board Management Agency Agreements (MAAs), Memorandum of Agreement (MOA), and Memoranda of Understanding (MOUs)

The Regional Water Board abides by State Water Board agreements with federal and State agencies which have been formalized with either an MAA, MOA, or an MOU signed by the State Water Board.

4.2.1.3.1 U.S. Forest Service Agreement

On 26 February 1981 the State Water Board Executive Director signed an MAA with the U.S. Forest Service (USFS) which waives discharge requirements for certain USFS nonpoint source discharges provided that the Forest Service implements State Water Board approved best management practices (BMPs) and procedures and the provisions of the MAA. The MAA covers all USFS lands in California. Implementation of the BMPs, in conjunction with monitoring and performance review requirements approved by the State and Regional Water Boards, is the

primary method of meeting the Basin Plan's water quality objectives for the activities to which the BMPs apply. The MAA does not include USFS point source discharges and in no way limits the authority of the Regional Water Board to carry out its legal responsibilities for management or regulation of water quality. See Appendix Item 13.

4.2.1.3.2 Department of Toxic Substances Control

On 27 January 1986, the State Water Board Chairperson signed an MOA with the Department of Health Services (later renamed to the Department of Toxic Substances Control) regarding the implementation of the hazardous waste program. The agreement covers surveillance and enforcement related to water quality at landfills, surface impoundments, waste piles, and land treatment facilities that treat, store, or dispose of hazardous waste. It also covers the issuance, modification, or denial of permits to facilities, including the revision of the water quality aspects of hazardous waste management facility siting, design, closure, post-closure, and surface and ground water monitoring and protection. See Appendix Item 14.

4.2.1.3.3 State Water Board Division of Drinking Water Programs

In 1988, the Chairman of the State Water Board signed an MOA with the Department of Health Services (later named the State Water Board Division of Drinking Water Programs) regarding the use of reclaimed water.

The MOA outlines the basic activities of the agencies, allocates primary areas of responsibility and authority between these agencies, and provides for methods and mechanisms to assure coordination for activities related to the use of reclaimed water. See Appendix Item 15.

4.2.1.3.4 California Department of Forestry Agreement

In February 1988, the State Water Board signed an MAA with the California Department of Forestry and Fire Protection (CDFFP) and the California Board of Forestry (BOF), for the purpose of carrying out, pursuant to Section 208 of the Federal Clean Water Act, those portions of the State's Water Quality Management Plan (WQMP) related to controlling water quality impacts caused by silvicultural activities on nonfederal forest lands. As with the USFS MAA, the CDFFP agreement requires the Department to implement certain BMPs to protect water quality from timber harvest and associated activities. Approval of the MAA as a WQMP component by the USEPA results in the Regional Water Boards relinquishing some authority to issue WDRs for State timber operations (Public Resources Code Section 4514.3). However, CDF and the Regional and State Water Boards must still ensure that the operations incorporate BMPs and comply with applicable water quality standards. Appendix F of the MAA also calls for the preparation of a Memorandum of Understanding (MOU) for the Regional Water Boards, the State Water Board, and the CDFFP to prescribe interagency procedures for implementing BMPs. See Appendix Item 16.

4.2.1.3.5 Department of Conservation Agreement

In March 1988, the State Water Board amended a February 1982 MOA with the State Department of Conservation, Division of Oil and Gas (CDOG), to regulate oil, gas, and geothermal fields' discharges. The agreement requires CDOG to notify the Regional Water Boards of all new operators, all pollution problems associated with operators, and proposed discharges. CDOG and Regional Water Boards must also work together, within certain time-lines, to review and prepare discharge permits. See Appendix Item 17.

4.2.1.3.6 Department of Toxic Substances Control

In July 1990, the State Water Board and the Department of Health Services, Toxic Substances Control Program (later reorganized into the Department of Toxic Substances Control) signed an MOU which explains the roles of the agencies (and of the Regional Water Boards) in the cleanup of hazardous waste sites. The MOU describes the protocol the agencies will follow to determine which agency will act as lead and which will act as support, the responsibilities of the agencies in their respective roles, the procedures the agencies will follow to ensure coordinated action, the technical and procedural requirements which each agency must satisfy, the procedures for enforcement and settlement, and the mechanism for dispute resolution. This MOU does not alter the Board's responsibilities with respect to water quality protection. See Appendix Item 18.

4.2.1.3.7 Soil Conservation Service, U.S. Department of Agriculture

On 31 July 1990, the State Water Board Executive Director signed an MOU with Soil Conservation Service (SCS), a technical agency for the U.S. Department of Agriculture. Through this MOU, State Water Board seeks to utilize the personnel and expertise of SCS in the development and implementation of water quality programs and projects. The goal is to accelerate implementation of best management practices and other nonpoint source pollution prevention measures. See Appendix Item 19.

4.2.1.3.8 Environmental Affairs Agency, Air Resources Board, and California Integrated Waste Management Board

On 27 August 1990, the State Water Board Executive Director signed an MOU with the Environmental Affairs Agency, Air Resources Board, and California Integrated Waste Management Board to enhance program coordination and reduce duplication of effort. This MOU consists of provisions describing the scope of the agreement (including definitions of the parties and issues to which the MOU applies), the principles which will govern the conduct of the parties, and the existing statutory framework. See Appendix Item 20.

4.2.1.3.9 California Department of Pesticide Regulation

On 23 December 1991, the State Water Board Chairman signed a MOU with the California Department of Pesticide Regulation (DPR) to ensure that pesticides registered in California are used in a manner that protects water quality and the beneficial uses of water while recognizing the need for pest control.

The State Water Board and nine Regional Water Boards are responsible for protecting the beneficial use of water in California and for controlling all discharges of waste into waters of the state while DPR is the lead agency for pesticide regulation in California.

This will be accomplished by implementing Best Management Practices (BMPs) initially upon voluntary compliance to be followed by regulatory-based encouragement of BMPs as circumstances dictate. Mandatory compliance will be based, whenever possible, on DPR's implementation of regulations and/or pesticide use permit requirements. However, the State Water Board and Regional Water Boards retain ultimate responsibility for compliance with water quality objectives. The agreement was revised on 19 January 1993 to facilitate implementation of the original agreement. See Appendix Item 21.

4.2.1.3.10 Implementation of the San Joaquin Valley Drainage Program's Recommended Plan

In January 1992, the State Water Board Chairman signed a MOU with the U.S. Bureau of Reclamation, the U.S. Fish and Wildlife Service, the U.S. Soil Conservation Service, the U.S. Geological Survey, the California Department of Fish and Game (later renamed the California Department of Fish and Wildlife), and the Department of Food and Agriculture. The MOU is an agreement by the agencies to use the management plan described in the September 1990 final report of the San Joaquin Valley Drainage Program as a guide for remedying subsurface drainage and related problems. See Appendix Item 22.

4.2.1.3.11 California Integrated Waste Management Board

On 16 December 1992, the State Water Board Executive Director signed a MOU to address the Regional Water Board's review of Solid Waste Assessment Test reports. See Appendix Item 23.

4.2.1.3.12 Bureau of Land Management

On 27 January 1993, the State Water Board Vice Chairman signed a MOU to address nonpoint source water quality issues on public lands managed by the Bureau. See Appendix Item 24.

4.2.2 Control Action Considerations of the Central Valley Regional Water Board

4.2.2.1 Policies and Plans

The following are the Regional Water Board's policies to protect water quality in the Central Valley:

4.2.2.1.1 Urban Runoff Policy

- (1) Subregional municipal and industrial plans are required to assess the impact of urban runoff on receiving water quality and consider abatement measures if a problem exists.
- (2) Effluent limitations for storm water runoff are to be included in NPDES permits where it results in water quality problems.

4.2.2.1.2 Wastewater Reuse Policy

The Regional Water Board encourages the reclamation and reuse of wastewater, including treated ground water resulting from a cleanup action, where practicable and requires as part of a Report of Waste Discharge an evaluation of reuse and land disposal options as alternative disposal methods. Reuse options should include consideration of the following, where appropriate, based on the quality of the wastewater and the required quality for the specific reuses: industrial and municipal supply, crop irrigation, landscape irrigation, ground water recharge, and wetland restoration. Where studies show that Year-round or continuous reuse or land disposal of all of the wastewater is not practicable, the Regional Water Board will require dischargers to evaluate how reuse or land disposal can be optimized, such as consideration of reuse/disposal for part of the flow and seasonal reuse/disposal options (e.g., dry season land disposal).

4.2.2.1.3 *Controllable Factors Policy*

Controllable water quality factors are not allowed to cause further degradation of water quality in instances where other factors have already resulted in water quality objectives being exceeded. Controllable water quality factors are those actions, conditions, or circumstances resulting from human activities that may influence the quality of the waters of the State, that are subject to the authority of the State Water Board or Regional Water Board, and that may be reasonably controlled.

4.2.2.1.4 *The Water Quality Limited Segment Policy*

Additional treatment beyond minimum federal requirements will be imposed on dischargers to Water Quality Limited Segments. Dischargers will be assigned or allocated a maximum allowable load of critical pollutants so that water quality objectives can be met in the segment.

To determine an allowable load for dischargers, the "Loading Capacity" must be determined. The "Loading Capacity" is the maximum amount of pollution that can be present in a water body without violating water quality objectives. The Loading Capacity can be established to address multiple pollutants or a single pollutant. The Loading Capacity can be allocated to NPDES permitted sources (point sources) as waste load allocations and to non-NPDES permitted sources (nonpoint sources) and background as load allocations. Part of the Loading Capacity may also be set aside or not assigned to account for any uncertainty in the Loading Capacity calculation.

The Loading Capacity and allocations are established to meet Clean Water Act Section 303(d) requirements. In addition, the Loading Capacity and allocations can provide a framework for actions to be taken by the Regional Water Board for achieving pollutant reductions and attaining water quality objectives.

4.2.2.1.5 *Regional Water Board Resolution No. 70-118, Delegation of Duties and Powers to the Regional Water Board's Executive Officer*

In January 1970, the Regional Water Board adopted Resolution No. 70-118 which delegates certain duties and powers of the Board to its Executive Officer pursuant to Section 13223 of the California Water Code. See Appendix Item 25.

4.2.2.1.6 *Regional Water Board Resolution No. 96-147, San Joaquin River Agricultural Subsurface Drainage Policy*

- (1) The control of toxic trace elements in agriculture subsurface drainage, especially selenium, is the first priority.
- (2) The control of agricultural subsurface drainage will be pursued on a regional basis.
- (3) The reuse of agricultural subsurface drainage will be encouraged, and actions that would limit or prohibit reuse discouraged.
- (4) Of the two major options for disposal of salts produced by agricultural irrigation, export out of the basin has less potential for environmental impacts and, therefore, is the favored option. The San Joaquin River may continue to be used to remove salts from the basin so long as water quality objectives are met.

- (5) The valley-wide drain to carry the salts generated by agricultural irrigation out of the valley remains the best technical solution to the water quality problems of the San Joaquin River and Tulare Lake Basin. The Regional Water Board, at this time, feels that a valley-wide drain will be the only feasible, long-range solution for achieving a salt balance in the Central Valley. The Regional Water Board favors the construction of a valley-wide drain under the following conditions:
 - All toxicants would be reduced to a level which would not harm beneficial uses of receiving waters.
 - The discharge would be governed by specific discharge and receiving water limits in an NPDES permit.
 - Long-term, continuous biological monitoring would be required.
- (6) Optimizing protection of beneficial uses on a watershed basis will guide the development of actions to regulate agricultural subsurface drainage discharges.
- (7) For regulation of selenium discharges, actions need to be focused on selenium load reductions.

4.2.2.1.7 Antidegradation Implementation Policy

The antidegradation directives of Section 13000 of the Water Code and State Water Board Resolution No. 68-16 ("Statement of Policy With Respect to Maintaining High Quality Waters in California") require that high quality waters of the State shall be maintained "consistent with the maximum benefit to the people of the State." The Regional Water Board applies these directives when issuing a permit, or in an equivalent process, regarding any discharge of waste which may affect the quality of surface or ground waters in the region.

Implementation of this policy to prevent or minimize surface and ground water degradation is a high priority for the Board. In nearly all cases, preventing pollution before it happens is much more cost-effective than cleaning up pollution after it has occurred. Once degraded, surface water is often difficult to clean up when it has passed downstream. Likewise, cleanup of ground water is costly and lengthy due, in part, to its relatively low assimilative capacity and inaccessibility. The prevention of degradation is, therefore, an important strategy to meet the policy's objectives.

The Regional Water Board will apply 68-16 in considering whether to allow a certain degree of degradation to occur or remain. In conducting this type of analysis, the Regional Water Board will evaluate the nature of any proposed discharge, existing discharge, or material change therein, that could affect the quality of waters within the region. Any discharge of waste to high quality waters must apply best practicable treatment or control not only to prevent a condition of pollution or nuisance from occurring, but also to maintain the highest water quality possible consistent with the maximum benefit to the people of the State.

Pursuant to this policy, a Report of Waste Discharge, or any other similar technical report required by the Board pursuant to Water Code Section 13267, must include information regarding the nature and extent of the discharge and the potential for the discharge to affect surface or ground water quality in the region. This information must be presented as an analysis of the impacts and potential impacts of the discharge on water quality, as measured by background concentrations and applicable water quality objectives. The extent of information necessary will depend on the specific conditions of the discharge. For example, use of best

professional judgment and limited available information may be sufficient to determine that ground or surface water will not be degraded. In addition, the discharger must identify treatment or control measures to be taken to minimize or prevent water quality degradation.

4.2.2.1.8 *Drinking Water Policy Implementation*

As a part of the Drinking Water Policy, a narrative objective has been established for *Cryptosporidium* and *Giardia* to protect the public water system component of the MUN beneficial use. Although it is unclear what levels of *Cryptosporidium* and *Giardia* will impair this use, the goal of implementation is to maintain existing levels of pathogens at public water system intakes. This will be achieved by addressing controllable sources that are shown to cause or substantially contribute to *Cryptosporidium* levels increasing to the trigger level of the next highest bin classification. In accordance with the USEPA Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR), public water systems are required to monitor for *Cryptosporidium* at their intakes; the monitoring results are used to establish the bin classification for the water system. To assure that *Cryptosporidium* levels at public water systems stay within the range of their existing bin classifications, triggers at public water system intakes are included below based on USEPA LT2ESWTR bin classifications. The triggers and the changes to LT2ESWTR bin levels do not indicate a violation of the narrative water quality objective for *Cryptosporidium* and *Giardia* nor are the triggers and the LT2ESWTR bin levels to be used for numeric effluent limits. Instead, the proposed numeric triggers may prompt action by the Regional Water Board.

4.2.2.1.8.1 *Cryptosporidium* Ambient Trigger Exceedance

If *Cryptosporidium* monitoring data from an existing public water system intake indicate that the maximum running annual average¹ has reached 80 percent of the next highest bin, as existed in 2013, the affected public water system may request that the Regional Water Board initiate the investigation described below and shown in [Figure 4-1](#). [Table 4-1](#) shows the 2013 LT2ESWTR bin classifications and the 80 percent trigger levels.

TABLE 4-1. BIN LEVELS AND 80 PERCENT TRIGGERS		
Bin Classification	Maximum Running Annual Average (oocysts/L)	80 Percent Trigger (oocysts/L)
1	< 0.075	0.06
2	0.075 to < 1.0	0.8
3	1.0 to < 3.0	2.4

If the affected public water system requests assistance, the Regional Water Board should coordinate with CDPH, the affected public water system and potential sources (e.g., storm water management entities, wastewater treatment or wetland managers, etc.) to assess the data and evaluate the need to conduct source evaluations and implement control options. The affected public water system may decline assistance from the Regional Water Board in addressing their compliance with the LT2ESWTR. The coordination and investigation effort should include the steps represented by the schematic overview in [Figure 4-1](#).

¹ *Maximum Running Annual Average as defined in USEPA Long Term 2 Enhanced Surface Water Treatment Rule*

4.2.2.1.8.2 Antidegradation Analysis

In addressing *Cryptosporidium* and *Giardia* in an antidegradation analysis for evaluating the public water system component of the MUN beneficial use, the monitoring results of the nearest impacted public water system intake shall be considered. In cases where a trigger (Section 4.2.2.1.8.1) at the nearest public water system intake has not been exceeded, the analysis should be simplified and may be curtailed, depending on the magnitude of the discharge in question and the likelihood of potential impact at public water system intakes. If a trigger has been exceeded, information from the resulting investigation should be considered in the antidegradation analysis.

4.2.2.1.8.3 Reasonable Potential

The Regional Water Board evaluated data representing 2013 conditions. An evaluation of this data indicates that the narrative water quality objective for *Cryptosporidium* and *Giardia* is being attained in surface waters at all public water system intakes in the Delta and its tributaries. The triggers and the changes between LT2ESWTR bin levels do not indicate a violation of the narrative water quality objective for *Cryptosporidium* and *Giardia* nor are the triggers and the LT2ESWTR bin levels to be used for numeric effluent limits.

The Regional Water Board will determine reasonable potential in accordance with the applicable state and federal regulatory requirements. For NPDES permittees, the numeric triggers as applied at the public water system intakes are part of the Regional Water Board's procedures under 40 CFR § 122.44(d)(1)(ii) for determining whether a discharge has reasonable potential. At the request of an affected public water system, implementation of the trigger provisions described in (Figure 4-1, flowchart) will help to ensure that management measures prevent violations of the narrative objective. As a result, NPDES dischargers are not expected to have a reasonable potential to cause or contribute to an excursion above the narrative objective, and NPDES permits are not expected to include effluent limitations to implement the narrative objective.

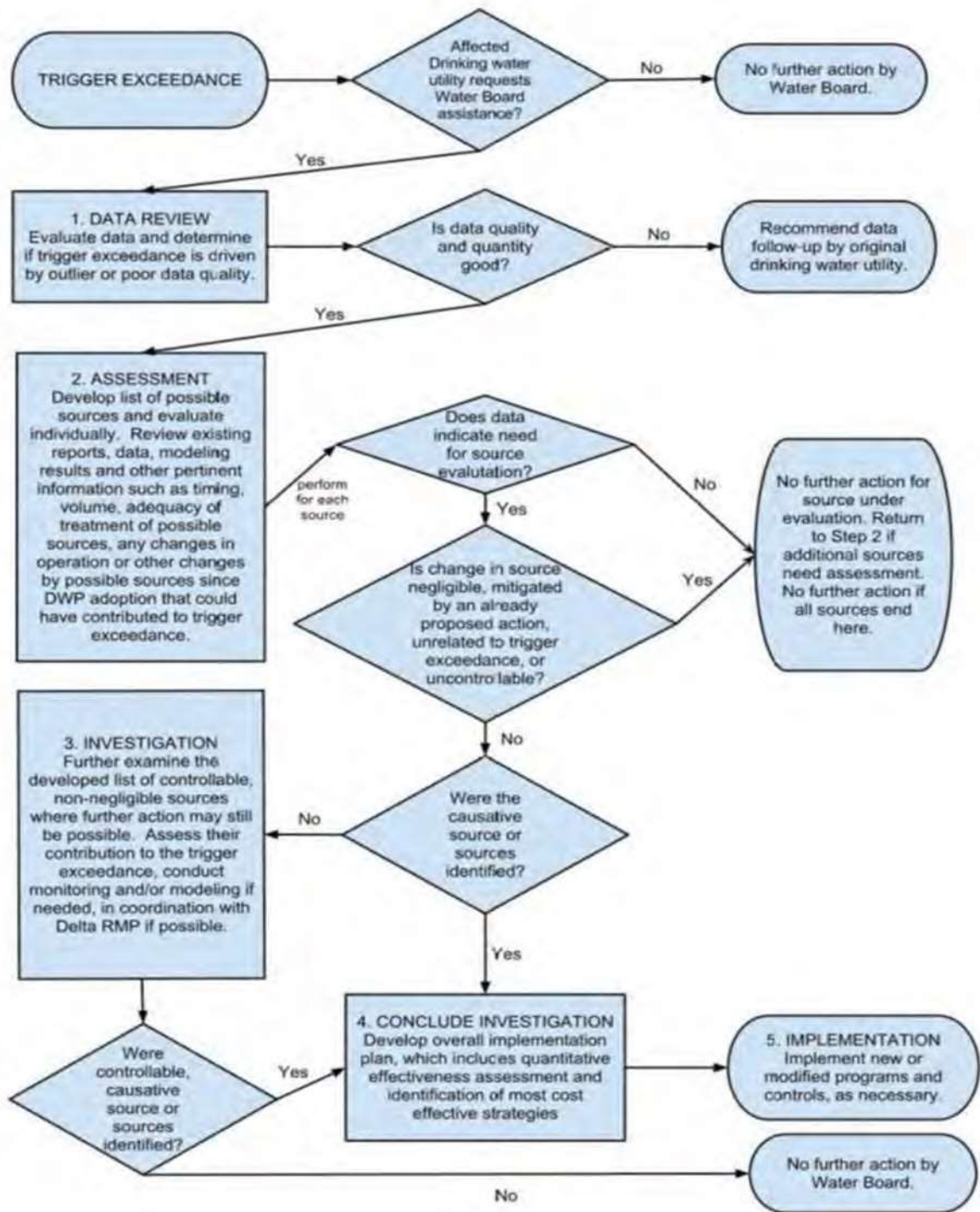


FIGURE 4-1: SCHEMATIC OVERVIEW OF ACTIONS PROMPTED BY CRYPTOSPORIDIUM TRIGGER EXCEEDANCE

4.2.2.1.9 Policy for Application of Water Quality Objectives

Water quality objectives are defined in the Water Code as "the limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area". (see Chapter 3). Water quality objectives may be stated in either numerical or narrative form. Water quality objectives apply to all waters within a surface water or ground water resource for which beneficial uses have been designated, rather than at an intake, wellhead or other point of consumption.

In conjunction with the issuance of NPDES and storm water permits, the Regional Water Board may designate mixing zones within which water quality objectives will not apply provided the discharger has demonstrated to the satisfaction of the Regional Water Board that the mixing zone will not adversely impact beneficial uses. If allowed, different mixing zones may be designated for different types of objectives, including, but not limited to, acute aquatic life objectives, chronic aquatic life objectives, human health objectives, and acute and chronic whole effluent toxicity objectives, depending in part on the averaging period over which the objectives apply. In determining the size of such mixing zones, the Regional Water Board will consider the applicable procedures and guidelines in EPA's Water Quality Standards Handbook and the Technical Support Document for Water Quality-based Toxics Control. Pursuant to EPA guidelines, mixing zones designated for acute aquatic life objectives will generally be limited to a small zone of initial dilution in the immediate vicinity of the discharge.

Where the Regional Water Board determines it is infeasible to achieve immediate compliance with water quality objectives adopted by the Regional Water Board or the State Water Board, or with water quality criteria adopted by the USEPA, or with an effluent limitation based on these objectives or criteria, the Regional Water Board may establish in NPDES permits a schedule of compliance. The schedule of compliance shall include a time schedule for completing specific actions that demonstrate reasonable progress toward the attainment of the objectives or criteria and shall contain a final compliance date, based on the shortest practicable time (determined by the Regional Water Board) required to achieve compliance. In no event shall an NPDES permit include a schedule of compliance that allows more than ten years (from the date of adoption of the objective or criteria) for compliance with water quality objectives, criteria or effluent limitations based on the objectives or criteria. Schedules of compliance are authorized by this provision only for those water quality objectives or criteria adopted after the effective date of this provision [25 September 1995]. The Regional Water Board will establish compliance schedules in NPDES permits consistent with the provisions of the State Water Board's Compliance Schedule Policy (Resolution 2008-0025). Time schedules in waste discharge requirements are established consistent with Water Code Section 13263.

State Water Board Resolution No. 68-16 requires the maintenance of the existing high quality of water (i.e., "background") unless a change in water quality "will be consistent with maximum benefit to the people of the State....". This policy explains how the Regional Water Board applies numerical and narrative water quality objectives to ensure the reasonable protection of beneficial uses of water and how the Regional Water Board applies Resolution No. 68-16 to promote the maintenance of existing high quality waters.

The numerical and narrative water quality objectives define the least stringent standards that the Regional Water board will apply to regional waters in order to protect beneficial uses. Numerical receiving water limitations will be established in Board orders for constituents and parameters which will, at a minimum, meet all applicable water quality objectives. However, the water quality objectives do not require improvement over naturally occurring background concentrations. In cases where the natural background concentration of a particular constituent exceeds an applicable water quality objective, the natural background concentration will be

considered to comply with the objective. Consistent with Resolution No. 68-16, the Regional Water Board will impose more stringent numerical limitations (or prohibitions) which will maintain the existing quality of the receiving water, unless, pursuant to Resolution No. 68-16, some adverse change in water quality is allowed. Maintenance of the existing high quality of water means maintenance of "background" water quality conditions, i.e., the water quality found upstream or upgradient of the discharge, unaffected by other discharges. Therefore, the water quality objectives will define the least stringent limits which will be imposed and background defines the most stringent limits which will be imposed on ambient water quality.

This Basin Plan contains numerical water quality objectives for various constituents and parameters in Chapter 3. Where numerical water quality objectives are listed, these are the limits necessary for the reasonable protection of beneficial uses of the water. In many instances, the Regional Water Board has not been able to adopt numerical water quality objectives for constituents or parameters, and instead has adopted narrative water quality objectives (e.g., for bacteria, chemical constituents, taste and odor, and toxicity). Where compliance with these narrative objectives is required (i.e., where the objectives are applicable to protect specified beneficial uses), the Regional Water Board will, on a case-by-case basis, adopt numerical limitations in orders which will implement the narrative objectives.

To evaluate compliance with the narrative water quality objectives, the Regional Water Board considers, on a case-by-case basis, direct evidence of beneficial use impacts, all material and relevant information submitted by the discharger and other interested parties, and relevant numerical criteria and guidelines developed and/or published by other agencies and organizations (e.g., State Water Board, State Water Board Division of Drinking Water Programs, California Office of Environmental Health Hazard Assessment, California Department of Toxic Substances Control, University of California Cooperative Extension, California Department of Fish and Wildlife, USEPA, U.S. Food and Drug Administration, National Academy of Sciences, U.S. Fish and Wildlife Service, Food and Agricultural Organization of the United Nations). In considering such criteria, the Board evaluates whether the specific numerical criteria, which are available through these sources and through other information supplied to the Board, are relevant and appropriate to the situation at hand and, therefore, should be used in determining compliance with the narrative objective. For example, compliance with the narrative objective for taste and odor may be evaluated by comparing concentrations of pollutants in water with numerical taste and odor thresholds that have been published by other agencies. This technique provides relevant numerical limits for constituents and parameters which lack numerical water quality objectives. To assist dischargers and other interested parties, the Regional Water Board staff has compiled many of these numerical water quality criteria from other appropriate agencies and organizations in the Central Valley Regional Water Board's staff report, *A Compilation of Water Quality Goals*. This staff report is updated regularly to reflect changes in these numerical criteria.

Where multiple toxic pollutants exist together in water, the potential for toxicologic interactions exists. On a case by case basis, the Regional Water Board will evaluate available receiving water and effluent data to determine whether there is a reasonable potential for interactive toxicity. Pollutants which are carcinogens or which manifest their toxic effects on the same organ systems or through similar mechanisms will generally be considered to have potentially additive toxicity. The following formula will be used to assist the Regional Water Board in making determinations:

$$\sum_{i=1}^n \frac{[\text{Concentration of Toxic Substances}]_i}{[\text{Toxicological Limit for Substances in Water}]_i} < 1.0$$

The concentration of each toxic substance is divided by its toxicologic limit. The resulting ratios are added for substances having similar toxicologic effects and, separately, for carcinogens. If such a sum of ratios is less than one, an additive toxicity problem is assumed not to exist. If the summation is equal to or greater than one, the combination of chemicals is assumed to present an unacceptable level of toxicologic risk. For example, monitoring shows that ground water beneath a site has been degraded by three volatile organic chemicals, A, B, and C, in concentrations of 0.3, 0.4, and 0.04 µg/l, respectively. Toxicologic limits for these chemicals are 0.7, 3, and 0.06 µg/l, respectively. Individually, no chemical exceeds its toxicologic limit. However, an additive toxicity calculation shows:

$$\frac{0.3}{0.7} + \frac{0.4}{3} + \frac{0.04}{0.06} = 1.2$$

The sum of the ratios is greater than unity (>1.0); therefore, the additive toxicity criterion has been violated. The concentrations of chemicals A, B, and C together present a potentially unacceptable level of toxicity.

For permitting purposes, it is important to clearly define how compliance with the narrative toxicity objectives will be measured. Staff is currently working with the State Water Board to develop guidance on this issue.

4.2.2.1.10 Policy for Investigation and Cleanup of Contaminated Sites

The Regional Water Board's strategy for managing contaminated sites is guided by several important principles, which are based on Water Code Sections 13000 and 13304, the Title 23, CCR, Division 3, Chapter 15 and Title 27, CCR, Division 2, Subdivision 1 regulations and State Water Board Resolution Nos. 68-16 and 92-49:

(1) State Water Board Policy & Regulation

The Regional Water Board will require conformance with the provisions of State Water Board Resolution No. 68-16 in all cases and will require conformance with applicable or relevant provisions of 23 CCR, Division 3, Chapter 15 and 27 CCR, Division 2, Subdivision 1 to the extent feasible. These provisions direct the Regional Water Board to ensure that dischargers are required to clean up and abate the effect of discharges in a manner that promotes attainment of background water quality, or the highest water quality which is reasonable and protective of beneficial uses if background levels of water quality cannot be restored.

(2) Site Investigation

An investigation of soil and ground water to determine full horizontal and vertical extent of pollution is necessary to ensure that cleanup plans are protective of water quality. The goal of the investigation shall be to determine where concentrations of constituents of concern exceed beneficial use protective levels (water quality objectives) and, additionally, where constituents of concern exceed background levels (the zero-impact line). Investigations shall extend off-site as necessary to determine the full extent of the impact.

(3) Source Removal/Containment

Immediate removal or containment of the source, to the extent practicable, should be implemented where necessary to prevent further spread of pollution as well as being among the most cost-effective remediation actions. The effectiveness of ground water cleanup techniques often depends largely on the completeness of source removal or containment efforts (e.g., removal of significantly contaminated soil or pockets of dense non-aqueous phase liquids).

(4) Cleanup Level Approval

Ground water and soil cleanup levels are approved by the Regional Water Board. The Executive Officer may approve cleanup levels as appropriately delegated by the Board.

(5) Site Specificity

Given the extreme variability of hydrogeologic conditions in the Region, cleanup levels must reflect site-specific factors.

(6) Discharger Submittals

The discharger must submit the following information for consideration by the Regional Water Board in establishing cleanup levels which meet the criteria contained in 23 CCR Section 2550.4(c) through (g):

- (a) water quality assessment to determine impacts and threats to the quality of water resources;
- (b) risk assessment to determine impacts and threats to human health and the environment; and
- (c) feasibility study of cleanup alternatives which compare effectiveness, cost, and time to achieve cleanup levels. Cleanup levels covered by this study shall include, at a minimum, background levels, levels which meet all applicable water quality objectives and which do not pose significant risks to health or the environment, and an alternate cleanup level which is above background levels and which also meets the requirements as specified in paragraphs (7)(e) and (f) below.

(7) Ground Water Cleanup Levels

Ground water cleanup levels shall be established based on:

- (a) background concentrations of individual pollutants;
- (b) applicable water quality objectives to protect designated beneficial uses of the water body, as listed in Chapters 2 and 3;
- (c) concentrations which do not pose a significant risk to human health or the environment, considering risks from toxic constituents to be additive across all media of exposure and, in the absence of scientifically valid data to the contrary, additive for all constituents having similar toxicologic effects or having carcinogenic effects; and

- (d) technologic and economic feasibility of attaining background concentrations and of attaining concentrations lower than defined by (b) and (c) above.

Factors in (a) through (d) above are used to establish ground water cleanup levels according to the following principles:

- (e) Pursuant to 23 CCR Section 2550.4, the Regional Water Board establishes cleanup levels that are protective of human health, the environment and beneficial uses of waters of the state, as measured by compliance with (b) and (c) above, and are equal to background concentrations if background levels are technologically and economically feasible to achieve. If background levels are infeasible to achieve, cleanup levels are set between background concentrations and concentrations that meet all criteria in (b) and (c) above. Within this concentration range, cleanup levels must be set at the lowest concentrations that are technologically and economically achievable. In no case are cleanup levels established below natural background concentrations.
- (f) Technologic feasibility is determined by assessing the availability of technologies which have been shown to be effective in reducing the concentrations of the constituents of concern to the established cleanup levels. Bench-scale and/or pilot-scale studies may be necessary to make this feasibility assessment in the context of constituent, hydrogeologic, and other site-specific factors. Economic feasibility does not refer to the subjective measurement of the ability of the discharger to pay the costs of cleanup, but rather to the objective balancing of the incremental benefit of attaining more stringent levels of constituents of concern as compared with the incremental cost of achieving those levels. Factors to be considered in the establishment of cleanup levels greater than background are listed in 23 CCR, Section 2550.4(d). The discharger's ability to pay is one factor to be considered in determining whether the cleanup level is reasonable. However, availability of economic resources to the discharger is primarily considered in establishing reasonable schedules for compliance with cleanup levels.
- (g) Compliance with (c) above shall be determined through risk assessments performed by the discharger, using the most current procedures authorized by the Department of Toxic Substances Control, the Office of Environmental Health Hazard Assessment, or the USEPA. The Regional Water Board is not the lead agency for specifying risk assessment procedures or for reviewing risk assessments. The Board will assist the discharger, as necessary, in obtaining the appropriate, most current procedures from the above listed agencies. To prevent duplication of effort, the Board will rely on the Department of Toxic Substances Control, the Office of Environmental Health Hazard Assessment, or appropriately designated local health agencies to review and evaluate the adequacy of health and environmental risk assessments. The Board will assist the discharger, as necessary, in determining which of these agencies will review the risk assessments for a particular site. Priority will be given to those agencies that are already involved with the assessment and cleanup of the site.

(8) Compliance with Ground Water Cleanup Levels

To protect potential beneficial uses of the water resource as required by Water Code Sections 13000 and 13241, compliance with ground water cleanup levels must occur throughout the pollutant plume.

(9) Modifying Ground Water Cleanup Levels

The Regional Water Board may consider modifying site-specific ground water cleanup levels (that have been determined pursuant to subsection (7) above) that are more stringent than applicable water quality objectives, only when a final remedial action plan has been pursued in good faith, and all of the following conditions are met:

- (a) Modified cleanup levels meet the conditions listed in (7)(b) and (c) above
- (b) An approved cleanup program has been fully implemented and operated for a period of time which is adequate to understand the hydrogeology of the site, pollutant dynamics, and the effectiveness of available cleanup technologies;
- (c) Adequate source removal and/or isolation is undertaken to eliminate or significantly reduce future migration of constituents of concern to ground water;
- (d) The discharger has demonstrated that no significant pollutant migration will occur to other underlying or adjacent aquifers;
- (e) Ground water pollutant concentrations have reached asymptotic levels using appropriate technology;
- (f) Optimization of the existing technology has occurred and new technologies have been evaluated and applied where economically and technologically feasible; and
- (g) Alternative technologies for achieving lower constituent levels have been evaluated and are inappropriate or not economically feasible.

(10) Soil Cleanup Levels

For soils which threaten the quality of water resources, soil cleanup levels should be equal to background concentrations of the individual leachable/mobile constituents, unless background levels are technologically or economically infeasible to achieve. Where background levels are infeasible to achieve, soil cleanup levels are established to ensure that remaining leachable/mobile constituents of concern will not threaten to cause ground water to exceed applicable ground water cleanup levels, and that remaining constituents do not pose significant risks to health or the environment. The Regional Water Board will consider water quality, health, and environmental risk assessment methods, as long as such methods are based on site-specific field data, are technically sound, and promote attainment of all of the above principles.

(11) Verification of Soil Cleanup

Verification of soil cleanup generally requires verification sampling and follow-up ground water monitoring. The degree of required monitoring will reflect the amount of uncertainty associated with the soil cleanup level selection process. Follow-up ground water monitoring may be limited where residual concentrations of leachable/mobile constituents in soils are not expected to impact ground water quality.

(12) Remaining Constituents

Where leachable/mobile concentrations of constituents of concern remain on-site in concentrations which threaten water quality, the Regional Water Board will require implementation of applicable provisions of Title 23, CCR, Division 3 Chapter 15 and Title 27, CCR, Division 2, Subdivision 1. Relevant provisions of Title 23, CCR, Division 3 Chapter 15 and Title 27, CCR, Division 2, Subdivision 1 which may not be directly applicable, but which address situations similar to those addressed at the cleanup site will be implemented to the extent feasible, in conformance with Title 23, CCR, Section 2511(d)/27 CCR, Section 20090(d). This may include, but is not limited to, surface or subsurface barriers or other containment systems, waste immobilization, toxicity reduction, and financial assurances.

4.2.2.1.11 Policy for Obtaining Salt Balance in the San Joaquin Valley

It is the policy of the Regional Water Board to encourage construction of facilities to convey agricultural drain water from the San Joaquin and Tulare Basins. A valley-wide conveyance facility for agricultural drain waters impaired by high levels of salt is the only feasible, long-range solution for achieving a salt balance in the Central Valley.

4.2.2.1.12 Watershed Policy

The Regional Water Board supports implementing a watershed based approach to addressing water quality problems. The State and Regional Water Boards are in the process of developing a proposal for integrating a watershed approach into the Board's programs. The benefits to implementing a watershed based program would include gaining participation of stakeholders and focusing efforts on the most important problems and those sources contributing most significantly to those problems.

4.2.2.1.13 Policy for the Royal Mountain King Mine Site in Calaveras County

(1) Groundwater Management Strategy at the Royal Mountain King Mine Site, in Calaveras County

The owner of the Royal Mountain King Mine Site shall continue to implement a groundwater management strategy to manage poor-quality groundwater at the Site and to protect good-quality groundwater. The strategy is to maintain the lowest practicable level of water in Skyrocket Pit Lake and prevent any measurably significant degradation of current water quality in groundwater downgradient of the MUN and AGR de-designation area shown in [Figure 2-2](#). In addition, saline leachate that emerges as springs at the base of the Gold Knoll Overburden Disposal Site and the West Overburden Disposal Site, as well as the Flotation Tailings Reservoir leachate collection and recovery system, shall be collected in sumps and transferred by pumping to Skyrocket Pit Lake or regulated with an NPDES permit or WDRs.

- (2) Variance for IND and PRO Uses in Groundwaters at the Royal Mountain King Mine site, in Calaveras County

Groundwaters within the area shown in [Figure 2-2](#) at the Royal Mountain King Mine Site are subject to a variance for the IND and PRO uses based on high background levels of total dissolved solids. The variance exempts the constituents listed in the table, below, from regulatory limits that would otherwise be determined from the IND and PRO beneficial uses.

Constituents in groundwater subject to the variance for IND and PRO include:
Total Dissolved Solids
Arsenic
Chloride
Nitrate
Selenium
Sulfate

4.2.2.1.14 Variance Policy for Surface Waters

As part of its state water quality standards program, states have the discretion to include variance policies. (40 C.F.R., §131.13.) This policy provides the Regional Water Board with the authority to grant a variance from application of water quality standards under certain circumstances.

4.2.2.1.14.1 Variances from Surface Water Quality Standards for Point Source Dischargers

- (1) A permit applicant or permittee subject to an NPDES permit may apply to the Regional Water Board for a variance from a surface water quality standard for a specific constituent(s), as long as the constituent is not a priority toxic pollutant identified in 40 C.F.R., §131.38(b)(1). A permit applicant or permittee may not apply to the Regional Water Board for a variance from a surface water quality standard for temperature. The application for such a variance shall be submitted in accordance with the requirements specified in section 4.2.2.1.14.2. The Central Valley Water Board may adopt variance programs that provide streamlined approval procedures for multiple dischargers that share the same challenges in achieving their water quality based effluent limitation(s) (WQBELs) for the same pollutant(s). The *Variance Program for Salinity Water Quality Standards* in section 4.2.2.1.14.3, below, is a multiple discharger variance program. Permittees that qualify for the *Variance Program for Salinity Water Quality Standards* by meeting the criteria in section 4.2.2.1.14.3(1), may submit a salinity variance application in accordance with the requirements specified in section 4.2.2.1.14.3 of this Policy.
- (2) The Regional Water Board may not grant a variance if:
- (a) Water quality standards addressed by the variance will be achieved by implementing technology-based effluent limitations required under sections 301(b) and 306 of the Clean Water Act, or
 - (b) The variance would likely jeopardize the continued existence of any endangered species under section 4 of the Endangered Species Act or result in the destruction or adverse modification of such species' critical habitat.

- (3) The Regional Water Board may approve all or part of a requested variance, or modify and approve a requested variance, if the permit applicant demonstrates a variance is appropriate based on at least one of the six following factors:
- (a) Naturally occurring pollutant concentrations prevent the attainment of the surface water quality standard; or
 - (b) Natural, ephemeral, intermittent, or low flow conditions or water levels prevent the attainment of the surface water quality standard, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating state water conservation requirements to enable surface water quality standards to be met; or
 - (c) Human caused conditions or sources of pollution prevent the attainment of the surface water quality standard and cannot be remedied or would cause more environmental damage to correct than to leave in place; or
 - (d) Dams, diversions, or other types of hydrologic modifications preclude the attainment of the surface water quality standard, and it is not feasible to restore the waterbody to its original condition or to operate such modification in a way that would result in the attainment of the surface water quality standard; or
 - (e) Physical conditions related to the natural features of the waterbody, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality preclude attainment of aquatic life protection of surface water quality standards; or
 - (f) Controls more stringent than those required by sections 301(b) and 306 of the Clean Water Act would result in substantial and widespread economic and social impact.
- (4) In making a determination on a variance application that is based on factor (c) in paragraph (3), above, the Regional Water Board may consider the following:
- (a) Information on the type and magnitude of adverse or beneficial environmental impacts, including the net impact on the receiving water, resulting from the proposed methodologies capable of attaining the adopted or proposed WQBEL.
 - (b) Other relevant information requested by the Regional Water Board or supplied by the applicant or the public.
- (5) In making a determination on a variance application that is based on factor (f) in paragraph (3), above, the Regional Water Board may consider the following:
- (a) The cost and cost-effectiveness of pollutant removal by implementing the methodology capable of attaining the adopted or proposed WQBEL for the specific constituent(s) for which a variance is being requested.
 - (b) The reduction in concentrations and loadings of the pollutant(s) in question that is attainable by source control and pollution prevention efforts as compared to the reduction attainable by use of the methodology capable of attaining the adopted or proposed WQBEL.
 - (c) The overall impact of attaining the adopted or proposed WQBEL and implementing the methodologies capable of attaining the adopted or proposed WQBEL.
 - (d) The technical feasibility of installing or operating any of the available methodologies capable of attaining the WQBEL for which a variance is sought.
 - (e) Other relevant information requested by the Regional Water Board or supplied by the applicant or the public.

- (6) A determination to grant or deny a requested variance shall be made in accordance with the procedures specified in section 4.2.2.1.14.2, below. Procedures specified in section 4.2.2.1.14.3, below, will be used for applicants that qualify for the *Variance Program for Salinity Water Quality Standards*.
- (7) A variance applies only to the permit applicant requesting the variance and only to the constituent(s) specified in the variance application.
- (8) A variance or any renewal thereof shall be for a time as short as feasible and shall not be granted for a term greater than ten years.
- (9) Neither the filing of a variance application nor the granting of a variance shall be grounds for the staying or dismissing of, or a defense in, a pending enforcement action. A variance shall be prospective only from the date the variance becomes effective.
- (10) A variance shall conform to the requirements of the State Water Board's Antidegradation Policy (State Water Board Resolution 68-16).

4.2.2.1.14.2 Variance Application Requirements and Processes

- (1) An application for a variance from a surface water quality standard for a specific constituent(s) subject to this Policy may be submitted at any time after the permittee determines that it is unable to meet a WQBEL or proposed WQBEL based on a surface water quality standard, and/or an adopted wasteload allocation. The variance application may be submitted with the renewal application (i.e., report of waste discharge) for a NPDES permit. If the permittee is seeking to obtain a variance after a WQBEL has been adopted into a NPDES permit, the WQBEL shall remain in effect until such time that the Regional Water Board makes a determination on the variance application.
- (2) The granting of a variance by the Regional Water Board is a discretionary action subject to the requirements of the California Environmental Quality Act. As such, the Regional Water Board may require the variance applicant to prepare such documents as are necessary so that the Regional Water Board can ensure that its action complies with the requirements set forth in the California Environmental Quality Act, or the Regional Water Board may use any such documents that have been prepared and certified by another state or local agency that address the potential environmental impacts associated with the project and the granting of a variance.
- (3) A complete variance application must contain the following:
 - (a) Identification of the specific constituent(s) and water quality standard(s) for which a variance is sought;
 - (b) Identification of the receiving surface water, and any available information with respect to receiving water quality and downstream beneficial uses for the specific constituent;
 - (c) Identification of the WQBEL(s) that is being considered for adoption, or has been adopted in the NPDES permit;
 - (d) List of methods for removing or reducing the concentrations and loadings of the pollutants with an assessment of technical effectiveness and the costs and cost effectiveness of these methods. At a minimum, and to the extent feasible, the methods must include source control measures, pollution prevention measures, facility upgrades and end-of-pipe treatment technology. From this list, the

- applicant must identify the method(s) that will consistently attain the WQBELs and provide a detailed discussion of such methodologies;
- (e) Documentation of at least one of the following over the next ten years. Documentation that covers less than ten years will limit the maximum term that the Regional Water Board can consider for the variance:
 - (i) That naturally occurring pollutant concentrations prevent the attainment of the surface water quality standard or
 - (ii) That natural, ephemeral, intermittent, or low flow conditions or water levels prevent the attainment of the surface water quality standard, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges to enable surface water quality standards to be met; or
 - (iii) That human caused conditions or sources of pollution prevent the attainment of the surface water quality standard from which the WQBEL is based, and it is not feasible to remedy the conditions or sources of pollution; or
 - (iv) That dams, diversions, or other types of hydrologic modifications preclude the attainment of the surface water quality standard from which the WQBEL is based, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in attainment of the surface water quality standard; or
 - (v) Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection of surface water quality standards from which the WQBEL is based; or
 - (vi) That installation and operation of each of the available methodologies capable of attaining the WQBEL would result in substantial and widespread economic and social impact.
 - (f) Documentation that the permittee has reduced, or is in the process of reducing, to the maximum extent practicable, the discharge of the pollutant(s) for which a variance is sought through implementation of local pretreatment, source control, and pollution prevention efforts; and,
 - (g) A detailed discussion of a proposed interim discharge limitation(s) that represents the highest level of treatment that the permittee can consistently achieve during the term of the variance. Such discussion shall also identify and discuss any drought, water conservation, and/or water recycling efforts that may cause certain constituents in the effluent to increase, or efforts that will cause certain constituents in the effluent to decrease with a sufficient amount of certainty. When the permittee proposes an interim discharge limitation(s) that is higher than the current level of the constituent(s) in the effluent due to the need to account for drought, water conservation or water recycling efforts, the permittee must provide appropriate information to show that the increase in the level for the proposed interim discharge limitation(s) will not adversely affect beneficial uses, is consistent with state and federal antidegradation policies (State Water Board Resolution No. 68-16 and 40 C.F.R., § 131.12.), and is consistent with anti-backsliding provisions specified in section 402(o) of the Clean Water Act. If the permittee indicates that certain constituents in the effluent are likely to decrease during the term of the variance due to recycling efforts or management measures, then the proposed interim discharge limitation(s) shall account for such decreases.

- (h) Copies of any documents prepared and certified by another state or local agency pursuant to Public Resources Code section 21080 et seq.; or, such documents as are necessary for the Regional Water Board to make its decision in compliance with Public Resources Code section 21080 et seq.
- (4) Within 60 days of the receipt of a variance application, the Regional Water Board shall determine that the variance application is complete, or specify in writing any additional relevant information, which is deemed necessary to make a determination on the variance request. Such additional information shall be submitted by the applicant within a time period agreed upon by the applicant and the Regional Water Board Executive Officer. Failure of an applicant to submit any additional relevant information requested by the Regional Water Board Executive Officer within the agreed upon time period may result in the denial of the variance application.
- (5) The Regional Water Board shall provide a copy of the variance application to USEPA Region 9 within 30 days of finding that the variance application is complete.
- (6) Within a reasonable time period after finding that the variance application is complete, the Regional Water Board shall provide public notice, request comment, and schedule and hold a public hearing on the variance application. When the variance application is submitted with the NPDES permit renewal application (i.e., report of waste discharge), the notice, request for comment and public hearing requirement on the variance application may be conducted in conjunction with the Regional Water Board's process for the renewal of the NPDES permit.
- (7) The Regional Water Board may approve the variance, either as requested, or as modified by the Regional Water Board. The Regional Water Board may take action to approve a variance and renew and/or modify an existing NPDES permit as part of the same Board meeting. The permit shall contain all conditions needed to implement the variance, including, at a minimum, all of the following:
 - (a) An interim effluent limitation for the constituent(s) for which the variance is sought. The interim effluent limitation(s) must be consistent with the current level of the constituent(s) in the effluent and may be lower based on anticipated improvement in effluent quality. The Regional Water Board may consider granting an interim effluent limitation(s) that is higher than the current level if the permittee has demonstrated that drought, water conservation, and/or water recycling efforts will cause the quality of the effluent to be higher than the current level and that the higher interim effluent limitation will not adversely affect beneficial uses. When the duration of the variance is shorter than the duration of the permit, compliance with effluent limitations sufficient to meet the water quality criterion upon the expiration of the variance shall be required;
 - (b) A requirement to prepare and implement a pollution prevention plan pursuant to Water Code section 13263.3 to address the constituent(s) for which the variance is sought;
 - (c) Any additional monitoring that is determined to be necessary by the Regional Water Board to evaluate the effects on the receiving water body of the variance from water quality standards;
 - (d) A provision allowing the Regional Water Board to reopen and modify the permit based on any revision to the variance made by the Regional Water Board during the next revision of the water quality standards or by EPA upon review of the variance; and

- (e) Other conditions that the Regional Water Board determines to be necessary to implement the terms of the variance.
- (8) The variance, as adopted by the Regional Water Board in section (7), is not in effect until it is approved by U.S. EPA.
- (9) Permit limitations for a constituent(s) contained in the applicant's permit that are in effect at the time of the variance application shall remain in effect during the consideration of a variance application for that particular constituent(s).
- (10) The permittee may request a renewal of a variance in accordance with the provisions contained in paragraphs (1), (2) and (3) and this section. For variances with terms greater than the term of the permit, an application for renewal of the variance may be submitted with the renewal application for the NPDES permit in order to have the term of the variance begin concurrent with the term of the permit. The renewal application shall also contain information concerning its compliance with the conditions incorporated into its permit as part of the original variance and shall include information to explain why a renewal of the variance is necessary. As part of its renewal application, a permittee shall also identify all efforts the permittee has made, and/or intends to make, towards meeting the standard(s). Renewal of a variance may be denied if the permittee did not comply with any of the conditions of the original variance.
- (11) All variances and supporting information shall be submitted by the Regional Water Board to the U.S. EPA Regional Administrator within 30 days of the date of the Regional Water Board's final variance decision for approval and shall include the following:
 - (a) The variance application and any additional information submitted to the Regional Water Board;
 - (b) Any public notices, public comments, and records of any public hearings held in conjunction with the request for the variance;
 - (c) The Regional Water Board's final decision; and
 - (d) Any changes to NPDES permits to include the variance.
- (12) All variances shall be reviewed during the Regional Water Board's triennial review process of this Basin Plan. For variances with terms that are greater than the term of the permit, the Regional Water Board may also review the variance upon consideration of the permit renewal.

4.2.2.1.14.3 Variance Program for Salinity Water Quality Standards

The State Water Board and the Regional Water Board recognize that salt is impacting beneficial uses in the Central Valley and management of salinity in surface and ground waters is a major challenge for dischargers. In response, the Water Boards initiated the Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) in 2006. The State Water Board *Recycled Water Policy* requires the development of salt and nutrient management plans protective of ground water and submittal of these plans to the Regional Water Board by May 2016. These plans are to become the basis of basin plan amendments to be considered by the Regional Water Board by May 2017. CV-SALTS is the stakeholder effort working to develop comprehensive salt and nitrate management plans (SNMPs) that will satisfy the *Recycled Water Policy's* salt and nutrient management plans. CV-SALTS is undertaking technical work to analyze salt and nitrate conditions in surface and ground water in the Central Valley, identify implementation measures, and develop monitoring strategies to ensure environmental and economic sustainability. The technical work under development includes developing the models

for loading and transport of salt, development and evaluation of effective management practices, and implementing activities to ensure beneficial uses are protected. Participation by all stakeholders is necessary to assure that the work is scientifically justified, supported by broad stakeholder representation, and completed in a timely fashion. The Regional Water Board has indicated its support for the comprehensive effort through CV-SALTS in Resolutions R5-2006-0024, R5-2010-0024, and R5-2013-0149 and the March 2010 Memorandum of Agreement between the Regional Water Board, the Central Valley Salinity Coalition and the State Water Board.

- (1) During the development and initial implementation of the SNMPs by CV-SALTS, permittees who qualify may apply for a variance from salinity water quality standards if they have or will have WQBELs for salinity that they are unable to meet by submitting a salinity variance application. The *Salinity Variance Program* as described specifically herein is for municipal and domestic wastewater dischargers that have or will implement local pretreatment, source control, and pollution prevention efforts to reduce the effluent concentrations of salinity constituents and are now faced with replacing the municipal water supply with a better quality water or installing costly improvements, such as membrane filtration treatment technology, such that widespread social and economic impacts are expected consistent with the justification provided for the case study cities in the *Staff Report for the Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins and the Water Quality Control Plan for the Tulare Lake Basin to add Policies for Variances from Surface Water Quality Standards for Point Source Dischargers, Variance Program for Salinity, and Exception from Implementation of Water Quality Objectives for Salinity, June 2014*. Consistent with the planned development and implementation of the SNMPs, no salinity variance under this section shall be approved after 30 June 2019. For the purposes of the Salinity Variance Program, salinity water quality standards are defined to only include water quality standards for the following constituents: electrical conductivity, total dissolved solids, chloride, sulfate and sodium.
- (2) An application for a variance for a specific salinity water quality standard may be submitted at any time after the permittee determines that it is unable to meet a WQBEL or proposed WQBEL based on a salinity water quality standard. Preferably, the salinity variance application should be submitted with the renewal application (i.e., report of waste discharge) for a NPDES permit. If the permittee is seeking to obtain a variance after a WQBEL has been adopted into a NPDES permit, the WQBEL shall remain in effect until such time that the Regional Water Board makes a determination on the variance application.
- (3) An application for variance from WQBELs based on a salinity water quality standard must contain the following:
 - (a) Identification of the salinity constituents for which the variance is sought;
 - (b) Identification of the receiving surface water, and any available information with respect to receiving water quality and downstream beneficial uses for the specific constituent;
 - (c) Identification of the WQBEL that is being considered for adoption, or has been adopted in the NPDES permit;
 - (d) A description of salinity reduction/elimination measures that have been undertaken as of the application date, if any;
 - (e) A Salinity Reduction Study Work Plan, which at a minimum must include the following:

- (i) Data on current influent and effluent salinity concentrations,
 - (ii) Identification of known salinity sources,
 - (iii) Description of current plans to reduce/eliminate known salinity sources,
 - (iv) Preliminary identification of other potential sources,
 - (v) A proposed schedule for evaluating sources,
 - (vi) A proposed schedule for identifying and evaluating potential reduction, elimination, and prevention methods.
 - (f) An explanation of the basis for concluding that there are no readily available or cost-effective methodologies available to consistently attain the WQBELs for salinity.
 - (g) A detailed discussion explaining why the permittee's situation is similar to or comparable with the case studies supporting the Salinity Variance Program identified in the *Staff Report for the Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins and the Water Quality Control Plan for the Tulare Lake Basin to add Policies for Variances from Surface Water Quality Standards for Point Source Dischargers, Variance Program for Salinity, and Exception from Implementation of Water Quality Objectives for Salinity, June 2014*.
 - (h) A detailed discussion of proposed interim discharge limitation(s) that represents the highest level of treatment that the permittee can consistently achieve during the term of the variance. If the permittee indicates that certain constituents in the effluent are likely to decrease during the term of the variance due to efforts, then the proposed interim discharge limitation(s) shall account for such decreases.
 - (i) Documentation of the applicant's active participation in CV-SALTS as indicated by a letter of support from CV-SALTS.
 - (j) A detailed plan of how the applicant will continue to participate in CV-SALTS and how the applicant will contribute to the development and implementation of the SNMPs.
- (4) After the receipt of a variance application for salinity, the Regional Water Board shall determine whether the variance application is complete and whether the permittee qualifies for consideration of the variance, or specify in writing any additional relevant information that is deemed necessary to make a determination on the salinity variance request. Such additional information shall be submitted by the applicant within a time period agreed upon by the applicant and the Regional Water Board Executive Officer. Failure of an applicant to submit any additional relevant information requested by the Regional Water Board Executive Officer within the time period specified by the Executive Officer may result in the denial of the variance application for salinity.
- (5) After determining that the variance application for salinity is complete, the Regional Water Board shall provide notice, request comment, and schedule and hold a public hearing on the variance application for salinity. When the variance application is submitted with the NPDES permit renewal application (i.e., report of waste discharge), the notice, request for comment and public hearing requirement on the variance application may be conducted in conjunction with the Regional Water Board's process for the renewal of the NPDES permit.
- (6) The Regional Water Board may approve a salinity variance, either as requested, or as modified by the Regional Water Board, after finding that the permittee qualifies for the salinity variance, the attainment of the WQBEL is not feasible, the permittee has implemented or will implement feasible salinity reduction/elimination measures and the permittee continues to participate in CV-SALTS consistent with the demonstrations based on the case studies identified in the Staff Report for the Amendments to the Water

Quality Control Plan for the Sacramento River and San Joaquin River Basins and the Water Quality Control Plan for the Tulare Lake Basin to add Policies for Variances from Surface Water Quality Standards for Point Source Dischargers, Variance Program for Salinity, and Exception from Implementation of Water Quality Objectives for Salinity, June 2014. The Regional Water Board may take action to approve a variance and issue a new, or reissue or modify an existing NPDES permit as part of the same Board meeting. The permit shall contain all conditions needed to implement the variance, including, at a minimum, all of the following:

- (a) The interim effluent limitation(s) that are determined to be attainable during the term of the variance. When the duration of the variance is shorter than the duration of the permit, compliance with effluent limitations sufficient to meet the water quality criterion upon the expiration of the variance shall be required;
 - (b) A requirement to implement the Salinity Reduction Study Work Plan submitted with the variance application as required by paragraph (3)(e), above;
 - (c) A requirement to participate in CV-SALTS and contribute to the development and implementation of the SNMPs in accordance with the plan required by paragraph (3)(j), above.
 - (d) Any additional monitoring that is determined to be necessary to evaluate the effects on the receiving water body of the variance from water quality standards;
 - (e) A provision allowing the Regional Water Board to reopen and modify the permit based on any revision to the variance made by the Regional Water Board during the next revision of the water quality standards;
 - (f) Other conditions that the Regional Water Board determines to be necessary to implement the terms of the variance.
- (7) Permit limitations for a substance contained in the applicant's permit that are in effect at the time of the variance application shall remain in effect during the consideration of the variance application for that particular substance.
- (8) The permittee may request a renewal of a salinity variance in accordance with the provisions contained in paragraphs (2) and (3) of this section. For variances with terms greater than the term of the permit, an application for renewal of the salinity variance may be submitted with the renewal application for the NPDES permit in order to have the term of the variance begin concurrent with the term of the permit. The renewal application shall also contain information concerning its compliance with the conditions incorporated into its permit as part of the original variance, and shall include information to explain why a renewal of the variance is necessary. As part of its renewal application, a permittee shall also identify all efforts the permittee has made, and/or intends to make, towards meeting the standard. Renewal of a variance may be denied if the permittee did not comply with the conditions of the original variance.
- (9) All variances shall be reviewed during the Regional Water Board's triennial review process of this Basin Plan. For variances with terms that are greater than the term of the permit, the Regional Water Board may also review the variance upon consideration of the permit renewal.

4.2.2.1.15 Limited-Term Exceptions from Basin Plan Provisions and Water Quality Objectives for Groundwater and for non-NPDES Dischargers to Surface Waters

Pursuant to Water Code sections 13050 and 13240 et seq., the Regional Water Board has adopted beneficial use designations and water quality objectives that apply to surface and ground waters in the basins covered by this Basin Plan as well as programs of implementation.

The Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) is a stakeholder effort to develop comprehensive salt and nitrate management plans (SNMPs) by May 2016 that is expected to result in basin plan amendments that will be considered by the Regional Water Board by May 2017. CV-SALTS is undertaking technical work to analyze salt and nitrate conditions in surface and ground water in the Central Valley, identify implementation measures, and develop monitoring strategies to ensure environmental and economic sustainability. The technical work under development includes developing the models for loading and transport of salt, development and evaluation of effective management practices, and implementing activities to ensure beneficial uses are protected. Participation by all stakeholders is necessary to ensure that the work is scientifically justified, supported by broad stakeholder representation, and completed in a timely fashion. The Regional Water Board has indicated its support for the comprehensive effort through CV-SALTS in Resolutions R5-2006-0024, R5-2010-0024, and R5-2013-0149 and the March 2010 Memorandum of Agreement between the Regional Water Board, the Central Valley Salinity Coalition and the State Water Board. The Regional Water Board finds that it is reasonable to grant exceptions to the discharge requirements related to the implementation of water quality objectives for salinity for non-NPDES dischargers to surface water, and for discharges to groundwater in order to allow for development and implementation of the SNMPs.

4.2.2.1.15.1 Exception to Discharge Requirements Related to the Implementation of Water Quality Objectives for Salinity

- (1) Any person² subject to waste discharge requirements and/or conditional waivers issued pursuant to Water Code 13269 that are not also NPDES permits may apply to the Regional Water Board for an exception to discharge requirements from the implementation of water quality objectives for salinity. The exception may apply to the issuance of effluent limitations and/or groundwater limitations that implement water quality objectives for salinity in groundwater, or to effluent limitations and/or surface water limitations that implement water quality objectives for salinity in surface water. For the purposes of this Program, salinity and its constituents include, and are limited to, the following: electrical conductivity, total dissolved solids, chloride, sulfate and sodium. The application for such an exception(s) shall be submitted in accordance with the requirements specified in paragraph (8), below.
- (2) An exception to discharge requirements from the implementation of water quality objectives for salinity imposed as limitations in either waste discharge requirements and/or conditional waivers that are not also NPDES permits shall be set for a term not to exceed ten years. For exception terms greater than five years, the Regional Water Board will review the exception five years after approval to confirm that the exception should proceed for the full term. The Regional Water Board review will be conducted during a public hearing. An exception may be renewed beyond the initial term if the SNMPs are still under development, and if a renewal application is submitted in accordance with the requirements specified in paragraph (8), below. A renewal must be considered during a public hearing held in accordance with paragraph 10, below.
- (3) The Regional Water Board will consider granting an exception to the implementation of water quality objectives for salinity under this Program if the applicant is actively participating in CV-SALTS as indicated by the letter required under paragraph (8)(e), below.

² The term "person" includes, but is not limited to, "any city, county, district, the state, and the United States, to the extent authorized by federal law." (Wat. Code, § 13050, subd. (c).)

- (4) When granting an exception to the implementation of water quality objectives for salinity under this Program, the Regional Water Board shall consider including an interim performance-based effluent limitation and/or groundwater limitation that provides reasonable protection of the groundwater or the receiving water, where appropriate. When establishing such a limitation, the Regional Water Board shall take into consideration increases in salinity concentrations due to drought, water conservation, and/or water recycling efforts that may occur during the term of the exception granted.
- (5) When granting an exception to the implementation of water quality objectives for salinity under this Program, the Regional Water Board shall require the discharger to prepare and implement a Salinity Reduction Study Work Plan, or a salinity-based watershed management plan. A Salinity Reduction Study Work Plan shall at a minimum include the following:
 - (a) Data on current influent and effluent salinity concentrations;
 - (b) Identification of known salinity sources;
 - (c) Description of current plans to reduce/eliminate known salinity sources;
 - (d) Preliminary identification of other potential sources;
 - (e) A proposed schedule for evaluating sources; and
 - (f) A proposed schedule for identifying and evaluating potential reduction, elimination, and prevention methods.

A salinity-based watershed management plan shall at a minimum include the following³:

- (a) A discussion of the physical conditions that affect surface water or groundwater in the management plan area, including land use maps, identification of potential sources of salinity, baseline inventory of identified existing management practices in use, and a summary of available surface and/or groundwater quality data;
 - (b) A management plan strategy that includes a description of current management practices being used to reduce or control known salinity sources;
 - (c) Monitoring methods;
 - (d) Data evaluation; and,
 - (e) A schedule for reporting management plan progress.
- (6) When granting an exception to the implementation of water quality objectives under this Program, the Regional Water Board will include a requirement to participate in CV-SALTS and contribute to the development and implementation of the SNMPs in accordance with the plan submitted under paragraph (8)(f), below.
- (7) The granting of an exception to the implementation of water quality objectives for salinity under this Program by the Regional Water Board is a discretionary action subject to the requirements of the California Environmental Quality Act. As such, the Regional Water Board may require the applicant for the exception to prepare such documents as are necessary so that the Regional Water Board can ensure that its action complies with the requirements set forth in the California Environmental Quality Act or the Regional Water Board may use any such documents that have been prepared and certified by another state or local agency that address the potential environmental impacts associated with

³ A salinity-based watershed management plan prepared to meet requirements contained within adopted waste discharge requirements, such as those contained in MRP Order R5-2012-0116, Appendix MRP-1, and that is approved by the Executive Officer of the Regional Water Board may be used in lieu of new requirements identified here.

the project and the granting of an exception from implementation of water quality objectives for salinity in groundwater and/or surface water.

- (8) A person seeking an exception to the implementation of water quality objectives for salinity under this Program must submit an application to the Regional Water Board. The person's request shall include the following:
- (a) An explanation/justification as to why the exception is necessary, and why the discharger is unable to ensure consistent compliance with existing effluent and/or groundwater/surface water limitations associated with salinity constituents at this time;
 - (b) A description of salinity reduction/elimination measures that the discharger has undertaken as of the date of application, or a description of a salinity-based watershed management plan and progress of its implementation;
 - (c) A description of any drought impacts, irrigation, water conservation and/or water recycling efforts that may be causing or cause the concentration of salinity to increase in the effluent, discharges to receiving waters, or in receiving waters;
 - (d) Copies of any documents prepared and certified by another state or local agency pursuant to Public Resources Code section 21080 et seq.; or, such documents as are necessary for the Regional Water Board to make its decision in compliance with Public Resources Code section 21080 et seq.
 - (e) Documentation of the applicant's active participation in CV-SALTS as indicated by a letter of support from CV-SALTS.
 - (f) A detailed plan of how the applicant will continue to participate in CV-SALTS and how the applicant will contribute to the development and implementation of the SNMPs.
- (9) Upon receipt of an application for an exception to the implementation of water quality objectives for salinity under this Program, the Regional Water Board shall determine that the exception application is complete, or specify in writing any additional relevant information, which is deemed necessary to make a determination on the exception request. Failure of an applicant to submit any additional relevant information requested by the Regional Water Board Executive Officer within the applicable time period may result in the denial of the exception application.
- (10) Within a reasonable time period after determining that the exception application is complete, the Regional Water Board shall provide notice, request comment, and schedule and hold a public hearing on the application within a timely manner. The notice and hearing requirements shall comply with those set forth in Water Code section 13167.5. The exception shall be issued through a resolution or special order that amends applicable waste discharge requirements and/or conditional waiver requirements.
- (11) There will be no new salinity exceptions and salinity exceptions will not be renewed after 30 June 2019.

4.2.2.2 Regional Water Board Memoranda of Understanding (MOU) and Memoranda of Agreement (MOA)

4.2.2.2.1 U.S. Bureau of Land Management

In September 1985, the Regional Water Board Executive Officer signed MOUs with the three U.S. Bureau of Land Management Districts in the Central Valley (i.e., the Ukiah District, the

Susanville District, and the Bakersfield District). The MOUs, which are identical for each District, aim at improving coordination between the two agencies for the control of water quality problems resulting from mineral extraction activities on BLM administered lands. See Appendix Items 26 through 28.

4.2.2.2 U.S. Bureau of Reclamation Agreement

On 2 July 1969, the Regional Water Board signed an MOA with the Bureau of Reclamation to schedule water releases from the New Melones Unit of the Central Valley Project to maintain an oxygen level at or above 5 mg/l in the Stanislaus River downstream of the unit and to not exceed a mean monthly TDS concentration of 500 mg/l in the San Joaquin River immediately below the mouth of the Stanislaus River. The MOA's water quality requirements are subject to some conditions. See Appendix Item 29.

4.2.2.3 California Department of Fish and Wildlife and Mosquito Abatement and Vector Control Districts of the South San Joaquin Valley

On 25 February 1993, the Regional Water Board Executive Officer signed an MOU with the California Department of Fish and Game (later renamed to the California Department of Fish and Wildlife) and 11 mosquito abatement and vector control districts of the south San Joaquin valley regarding vegetation management in wastewater treatment facilities. The MOU designates the Districts as lead agencies in determining the adequacy of vegetation management operations in abating mosquito breeding sources. Included in the MOU are the definition of vegetative management operations and conditions to protect nesting birds, eggs, and nests. See Appendix Item 30.

4.2.2.3 Regional Water Board Waivers

State law allows Regional Water Boards to conditionally waive WDRs for a specific discharge or types of discharges where the waiver is consistent with any applicable state or regional water quality control plan and it is in the public interest. A waiver may not exceed five years in duration, but may be renewed by a Regional Water Board. Waiver conditions must include monitoring requirements unless the Regional Water Board determines that the discharge does not pose a significant threat to water quality. Prior to renewing any waiver for a specific type of discharge, the Regional Water Board shall review the terms of the waiver policy at a public hearing. At the hearing, the Regional Water Board shall determine whether the discharge for which the waiver policy was established should be subject to general or individual waste discharge requirements. (Water Code Section 13269)

The Regional Water Board may, after compliance with the California Environmental Quality Act (CEQA), allow short-term variances from Basin Plan provisions, if determined to be necessary to implement control measures for vector and weed control, pest eradication, or fishery management which are being conducted to fulfill statutory requirements under California's Fish and Game, Food and Agriculture, or Health and Safety Codes. In order for the Regional Water Board to determine if a variance is appropriate, agencies proposing such activities must submit to the Regional Water Board project-specific information, including measures to mitigate adverse impacts.

4.2.2.4 Regional Water Board Prohibitions

The Porter-Cologne Water Quality Control Act allows the Regional Water Board to prohibit certain discharges (Water Code Section 13243). Prohibitions may be revised, rescinded, or

adopted as necessary. The prohibitions applicable to the Sacramento and San Joaquin River Basins are identified and described below.

[NOTE: Costs incurred by any unit of local government for a new program or increased level of service for compliance with discharge prohibitions in the Basin Plan do not require reimbursement by the State per Section 2231 of the Revenue and Taxation Code, because the Basin Plan implements a mandate previously enacted by statute, Chapter 482, Statutes of 1969.]

4.2.2.4.1 *Water Bodies*

Water bodies for which the Regional Water Board has held that the direct discharge of wastes is inappropriate as a permanent disposal method include sloughs and streams with intermittent flow or limited dilution capacity.

The direct discharge of municipal and industrial wastes (excluding storm water discharges) into the following specific water bodies has been prohibited, as noted:

- American River, including Lake Natoma (from Folsom Dam to mouth)
- Clear Lake
- Folsom Lake
- Fourteen Mile Slough at Stockton N.W. and Lincoln Village
- Lake Berryessa
- Middle Fork, Feather River (from Dellecker to Lake Oroville)
- Lake Oroville
- Sacramento River (from confluence with the Feather River to the Freeport Bridge).
[Note: There are two exceptions, (1) discharges of combined municipal waste and storm runoff flow from the City of Sacramento, and (2) discharges of treated/disinfected municipal waste from the City of West Sacramento when the City's Clarksburg outfall line is at its maximum hydraulic capacity and when Sacramento River flow is greater than 80,000 cfs, are not subject to the prohibition. The discharges are to be controlled through waste discharge requirements.]
- Sacramento Ship Channel and Turning Basin
- Shasta Lake
- Sugar Cut at Tracy
- Thermalito Forebay and Afterbay
- Tulloch Reservoir
- Whiskeytown Reservoir
- Willow Creek-Bass Lake in Madera County (the prohibition is for sewage effluent only)

4.2.2.4.2 *Leaching Systems*

Discharge of wastes from new and existing leaching and percolation systems has been prohibited by the Regional Water Board in the following areas:

- Amador City, Amador County (Adopted by Regional Water Board Order No. 73-129; effective as of 12/15/72)
- Martell Area, Amador County (73-129; 12/15/72)
- Shasta Dam Area Public Utilities District, Shasta County (73-129; 12/15/72)
- Vallecito Area, Calaveras County (73-129; 12/15/72)
- West Point Area, Calaveras County (73-129; 12/15/72)
- Celeste Subdivision Area, Merced County (73-129; 12/15/72)
- Snelling Area, Merced County (73-129; 12/15/72, and amended 74-126; 12/14/73)
- North San Juan, Nevada County (74-123; 12/14/73)

- Arnold Area, Calaveras County (74-124, 75-180; 12/14/73, 6/25/75)
- Contra Costa County Sanitation District No. 15, Contra Costa County (74-125; 12/14/73)
- Madera County Service Area No. 2, Bass Lake (74-127; 12/14/73)
- Madera County Service Area No. 3, Parksedale (74-128; 12/14/73)
- Coulterville County Service Area No. 1, Mariposa County (75-070; 3/21/75)
- Midway Community Services District, Merced County (75-072; 3/21/75)
- Adin Community Services District, Modoc County (75-272 11/21/75)
- Fall River Mills, Community Services District, Shasta County (75-273; 11/21/75)
- Bell Road Community, including Panorama and Pearl, Placer County (75-274; 11/21/75)
- Nice and Lucerne, Lake County (76-58; 2/27/76)
- Courtland Sanitation District, Sacramento County (76-59; 2/27/76)
- Six-Mile Village, Calaveras County (76-60; 2/27/76)
- Communities of Clearlake Highlands and Clearlake Park, Lake County (76-89; 3/26/76)
- Taylorsville County Service Area, Plumas County (76-129; 5/28/76)
- Community of South Lakeshore Assessment District, Lake County (76-215; 9/24/76)
- Anderson-Cottonwood Irrigation District, Community of Cottonwood, Shasta County (76-230; 10/22/76)
- Daphnedale Area, Modoc County (76-231; 10/22/76)
- Chico Urban Area, Butte County (90-126; 4/27/90)

4.2.2.4.3 *Petroleum*

The Regional Water Board has prohibited the discharge of oil or any residuary product of petroleum to the waters of the State, except in accordance with waste discharge requirements or other provisions of Division 7, California Water Code.

4.2.2.4.4 *Vessel Wastes*

The Regional Water Board has prohibited the discharge of toilet wastes from the vessels of all houseboat rental businesses on Shasta Lake, Clear Lake, and the Delta.

4.2.2.4.5 *Pesticides*

Effective immediately for molinate and thiobencarb and on 1 January 1991 for carbofuran, malathion and methyl parathion, the discharge of irrigation return flows containing these pesticides is prohibited unless the discharger is following a management practice approved by the Board. Proposed management practices for these pesticides will not be approved unless they are expected to meet the performance goals contained in the following table. Also, the management practices must ensure that discharges of thiobencarb to waters designated as municipal or domestic water supplies will comply with the 1.0 µg/l water quality objective for this pesticide. It is important to note that the performance goals in this timetable are interim in nature and while they are based on the best available information, they are not to be equated with concentrations that meet the water quality objectives. The intent of the performance goals is to bring concentrations being found in surface waters down to levels that approach compliance with the objectives. Future performance goals and numerical objectives will be set using the results of ongoing evaluations of the risks posed by these pesticides. Future performance goals may also be site-specific to take into consideration the additive impacts of more than one pesticide being present in a water body at the same time. The Board will reexamine the progress of the control effort for these pesticides in 1993 and will set performance goals intended to bring concentrations of these five pesticides into full compliance with all objectives by 1995.

Performance Goals ¹ for Management Practices in µg/l				
	YEAR			
<u>Pesticide</u>	<u>1990</u>	<u>1991</u>	<u>1992</u>	<u>1993</u>
Carbofuran	D	0.4	0.4	R
Malathion	I	0.1	R	R
Molinate	30.0	20.0	10.0	R
Methyl parathion	D	0.26	0.13	R
Thiobencarb	3.0	1.5	R	R

¹ Performance goals are daily maxima and apply to all waters designated as freshwater habitat.

D = No numerical goal - control practices under development

I = No numerical goal - sources of discharge to be identified by special study

R = The Regional Board will review the latest technical and economic information determine if the performance goal should be adjusted

4.2.2.4.6 San Joaquin River Subsurface Agricultural Drainage

- (1) The discharge of agricultural subsurface drainage from the Grassland watershed to the San Joaquin River or its tributaries from any on-farm subsurface drain, open drain, or similar drain system is prohibited, unless such discharge began prior to the effective date of this amendment (10 January 1997) or unless such discharge is governed by waste discharge requirements.
- (2) The discharge of agricultural subsurface drainage water to Salt Slough and wetland water supply channels identified in Appendix 40 is prohibited after 10 January 1997, unless water quality objectives for selenium are being met.
- (3) The discharge of agricultural subsurface drainage water to the San Joaquin River from Sack Dam to Mud Slough (north) is prohibited after 1 October 2010, unless water quality objectives for selenium are being met. The discharge of agricultural subsurface drainage water to Mud Slough (north) and the San Joaquin River from the Mud Slough confluence to the Merced River is prohibited after 31 December 2019 unless water quality objectives for selenium are being met. The prohibition becomes effective immediately upon Board determination that timely and adequate mitigation, as outlined in the 2010-2019 *Agreement for Continued Use of the San Luis Drain*⁴ has not been provided.
- (4) The discharge of selenium from agricultural subsurface drainage systems in the Grassland watershed to the San Joaquin River is prohibited in amounts exceeding 8,000 lbs/year for all water year types beginning 10 January 1997.

⁴ United States Department of the Interior, Bureau of Reclamation, Central Valley Project, California and San Luis & Delta-Mendota Water Authority, Los Banos, CA, *Agreement for Continued Use of the San Luis Drain for the period January 1 2010, through December 31, 2019*.

- (5) Activities that increase the discharge of poor quality agricultural subsurface drainage are prohibited.

4.2.2.4.7 *Diazinon and Chlorpyrifos Discharges into the Sacramento and Feather Rivers*

Beginning August 11, 2008, the direct or indirect discharge of diazinon or chlorpyrifos into the Sacramento and Feather Rivers is prohibited if, in the previous year (July-June), any exceedance of the diazinon or chlorpyrifos water quality objectives, or diazinon and chlorpyrifos loading capacity occurred.

These prohibitions do not apply if the discharge of diazinon or chlorpyrifos is subject to a waiver of waste discharge requirements implementing the diazinon and chlorpyrifos water quality objectives and load allocations for diazinon and chlorpyrifos for the Sacramento and Feather Rivers, or governed by individual or general waste discharge requirements.

These prohibitions apply only to dischargers causing or contributing to the exceedance of the water quality objective or loading capacity.

4.2.2.4.8 *Dissolved Oxygen in the Stockton Deep Water Ship Channel (DWSC)*

The discharge of oxygen demanding substances or their precursors into waters tributary to the DWSC portion of the San Joaquin River is prohibited after 31 December 2011 when net daily flow in the DWSC portion of the San Joaquin River in the vicinity of Stockton is less than 3,000 cubic feet per second, unless dissolved oxygen objectives in the DWSC are being met.

Any increase in the discharge of oxygen demanding substances or their precursors into waters tributary to the DWSC portion of the San Joaquin River is prohibited after 23 August 2006.

These prohibitions do not apply if the discharge is regulated by a waiver of waste discharge requirements, or individual or general waste discharge requirements or NPDES permits, which implement the *Control Program for Factors Contributing to the Dissolved Oxygen Impairment in the Stockton Deep Water Ship Channel* or which include a finding that the discharge will have no reasonable potential to cause or contribute to a negative impact on the dissolved oxygen impairment in the DWSC. These prohibitions will be reconsidered by the Regional Water Board by December 2009 based on:

- (1) the results of the oxygen demand and precursor studies required in the *Control Program for Factors Contributing to the Dissolved Oxygen Impairment in the Stockton Deep Water Ship Channel*
- (2) the prevailing dissolved oxygen conditions in the DWSC

4.2.2.4.9 *Control of Diazinon and Chlorpyrifos Runoff into the San Joaquin River*

Beginning 1 December 2010, the direct or indirect discharge of diazinon or chlorpyrifos into the San Joaquin River is prohibited during the dormant season (1 December through 1 March) if any exceedance of the chlorpyrifos or diazinon water quality objectives, or diazinon and chlorpyrifos loading capacity occurred during the previous dormant season.

Beginning 2 March 2011, the direct or indirect discharge of diazinon or chlorpyrifos into the San Joaquin River is prohibited during the irrigation season (2 March through 30 November) if any exceedance of the chlorpyrifos or diazinon water quality objectives, or diazinon and chlorpyrifos loading capacity occurred during the previous irrigation season.

These prohibitions apply only to i) dischargers who discharge the pollutant causing or contributing to the exceedance of the water quality objective or loading capacity; and ii) dischargers located in those subareas not meeting their load allocations.

These prohibitions do not apply if the discharge of diazinon or chlorpyrifos is subject to a waiver of waste discharge requirements implementing the diazinon and chlorpyrifos water quality objectives and load allocations for diazinon and chlorpyrifos for the San Joaquin River, or governed by individual or general waste discharge requirements.

4.2.2.4.10 Control of Diazinon and Chlorpyrifos Runoff into Delta Waterways (as identified in Appendix 42)

Beginning December 1, 2011, the direct or indirect discharge of diazinon or chlorpyrifos into Delta Waterways is prohibited during the dormant season (1 December through 1 March) if any exceedance of the chlorpyrifos or diazinon water quality objectives, or diazinon and chlorpyrifos loading capacity occurred during the previous dormant season.

Beginning March 2, 2012, the direct or indirect discharge of diazinon or chlorpyrifos into Delta Waterways is prohibited during the irrigation season (2 March through 30 November) if any exceedance of the chlorpyrifos or diazinon water quality objectives, or diazinon and chlorpyrifos loading capacity occurred during the previous irrigation season.

These prohibitions do not apply if the discharge of diazinon or chlorpyrifos is subject to a waiver of waste discharge requirements implementing the diazinon and chlorpyrifos water quality objectives and load allocations for diazinon and chlorpyrifos for the Delta Waterways, or governed by individual or general waste discharge requirements.

These prohibitions apply only to dischargers causing or contributing to the exceedance of the water quality objective or loading capacity.

These prohibitions do not apply to direct or indirect discharges to the Sacramento or San Joaquin Rivers upstream of the legal boundary of the Delta (as defined in Section 12220 of the California Water Code).

4.2.2.4.11 Diazinon and Chlorpyrifos Discharges

Dischargers are prohibited from discharging chlorpyrifos and/or diazinon at concentrations that exceed water quality objectives to waters with designated or existing⁵ WARM and/or COLD beneficial uses unless:

- The discharge is regulated under a waiver of waste discharge requirements or individual or general waste discharge requirements, or
- The discharge is upstream of one of the dams listed in [Table 3-5](#).

4.2.2.5 Regional Water Board Guidelines

The Regional Water Board has adopted guidance for certain types of dischargers which is designed to reduce the possibility that water quality will be impaired. The Regional Water Board may still impose discharge requirements. All of the Guidelines are contained in the Appendix

⁵ Existing as defined in Title 40 of the Code of Federal Regulations, section 131.3(e)

(Items 33 through 37). Currently, the following Guidelines apply to the Sacramento and San Joaquin River Basins:

4.2.2.5.1 Wineries

This Guideline contains criteria for protecting beneficial uses and preventing nuisance from the disposal to land of stillage wastes.

4.2.2.5.2 Erosion and Sedimentation

This Guideline identifies practices to be implemented by local government to reduce erosion and sedimentation from construction activities.

4.2.2.5.3 Small Hydroelectric Facilities

This Guideline specifies measures to protect water quality from temperature, turbidity, and dissolved oxygen effects from the construction and operation of small hydroelectric Facilities.

4.2.2.5.4 Mining

This Guideline identifies actions that the Regional Water Board takes to address the water quality problems associated with mining. It requires owners and operators of active mines to prepare plans for closure and reclamation, but it does not specify any practices or criteria for mine operators.

4.2.2.6 Nonpoint Source Action Plans

Section 208 of the 1972 Amendments to the Federal Clean Water Act resulted in monies being made available to states to address nonpoint source problems. The Regional Water Board used 208 grant funds to develop its mining and erosion/sedimentation guidelines, among other things. It also encouraged local governments to make use of the 208 program. As a result, several counties in the sub-basins developed action plans to control nonpoint source problems which affected them. The Regional Water Board action plans are described in [Table 4-2](#)

**TABLE 4-2
NONPOINT SOURCE ACTION PLANS**

<u>LOCATION</u>	<u>RECOMMENDED ACTION</u>
Shasta County	Best Management Practices (BMPs) for control of erosion from land development (adopted 1980)
Nevada County	BMPs for erosion and individual wastewater disposal systems (adopted 1980)
Placer County	BMPs for erosion and installation of individual wastewater disposal systems (adopted 1980)
Lake County	BMPs for erosion and creek bed management (adopted 1979)
Communities of Paradise and Magalia (Butte County)	BMPs for wastewater management (adopted 1979)
Solano County	BMPs for surface water runoff (adopted 1979)
Upper Putah Creek Watershed (Lake, Napa Counties)	Strategies and recommendations for addressing problems from geothermal development, abandoned mines, and individual wastewater disposal systems (adopted 1981)
Fall River (Shasta County)	BMPs for livestock grazing and individual wastewater disposal systems (adopted 1982)
Plumas County	BMPs for erosion control (adopted 1980)
Mariposa County	BMPs for individual wastewater disposal systems for area north of the community of Mariposa; BMPs for erosion and sedimentation in the Stockton Creek Watershed (adopted 1979)
Merced County	Lake Yosemite Area -- BMPs for individual wastewater disposal systems (adopted 1979)

4.3 ACTIONS RECOMMENDED FOR IMPLEMENTATION BY OTHER ENTITIES

Consistent with the Porter-Cologne Water Quality Control Act, the Basin Plan may identify control actions recommended for implementation by agencies other than the Regional Water Board [Water Code Section 13242(a)].

4.3.1 Recommended for Implementation by the State Water Board

4.3.1.1 Interbasin Transfer of Water

Before granting new permits for water storage or diversion which involves interbasin transfer of water, the State Water Board should require the applicant to evaluate the alternatives listed below. Permits should not be approved unless the alternatives have been thoroughly investigated and ruled out for social, environmental, or economic reasons.

- (1) In situations where wastewater is discharged to marine waters without intervening beneficial use (for example, the San Francisco Bay Area and most of Southern California), increase the efficiency of municipal, industrial, and agricultural water use.
- (2) Make optimum use of existing water resource facilities.
- (3) Store what would otherwise be surplus wet-weather Delta outflows in off-stream reservoirs.
- (4) Conjunctively use surface and ground waters.
- (5) Give careful consideration to the impact on basin water quality of inland siting of power plants.
- (6) Make maximum use of reclaimed water while protecting public health and avoiding severe economic penalties to a particular user or class of users.

4.3.1.2 Trans-Delta Water Conveyance

The State Water Board should adopt the position that those proposing trans-Delta water conveyance facilities must clearly demonstrate the following, if such a facility is constructed:

- (1) Protection of all beneficial uses in the Delta that may be affected by such a facility;
- (2) Protection of all established water quality objectives that may be affected by such a facility; and,
- (3) Adherence to the six alternatives previously identified for Interbasin Transfer of Water.

4.3.1.3 Water Quality Planning

A core planning group has been established within the staff of the State Water Board, which has the responsibility to integrate the statewide planning of water quality and water resources management.

4.3.1.4 Water Intake Studies

The State Water Board should coordinate studies to assess the costs and benefits of moving planned diversions from the eastern side of the Central Valley to points further west, probably to the Delta, to allow east side waters to flow downstream for uses of fishery enhancement, recreation, and quality control. Specific study items should include:

- (1) Possible intake relocations;

- (2) Conveyance and treatment required to accommodate such relocations;
- (3) Direct and indirect (including consumer and environmental) costs and benefits of relocation; and,
- (4) Institutional problems.

The State Water Board should request voluntary participation in the studies by agencies planning diversions, but should take appropriate action through its water rights authority if such participation cannot be obtained. At a minimum, participation would be required of the San Francisco Water Department and East Bay Municipal Utility District.

4.3.1.5 Subsurface Agricultural Drainage

- (1) The Regional Board will request that the State Water Board use its water rights authority to preclude the supplying of water to specific lands, if water quality objectives are not met by the specified compliance dates and Regional Board administrative remedies fail to achieve compliance.
- (2) The State Water Board should work jointly with the Regional Water Board in securing compliance with the 2 µg/l selenium objective for managed- wetlands in the Grassland area.
- (3) The State Water Board should also consider grant funds to implement a cost share program to install a number of flow monitoring stations within the Grassland area to assist in better defining the movement of pollutants through the area.
- (4) The State Water Board should continue to consider the Drainage Problem Area in the San Joaquin Basin and the upper Panoche watershed (in the Tulare Basin) as priority nonpoint source problems in order to make USEPA nonpoint source control funding available to the area.
- (5) The State Water Board should seek funding for research and demonstration of advanced technology that will be needed to achieve final selenium loads necessary to meet selenium water quality objectives.

4.3.1.6 Salt and Boron in the Lower San Joaquin River

- (1) The State Water Board should consider the continued use of its water rights authority to prohibit water transfers if the transfer contributes to low flows and related salinity water quality impairment in the Lower San Joaquin River.
- (2) The State Water Board should consider the continued conditioning of water rights on the attainment of existing and new water quality objectives for salinity in the Lower San Joaquin River, when these objectives cannot be met through discharge controls alone.

4.3.1.7 Dissolved Oxygen in the Stockton Deep Water Ship Channel (DWSC)

- (1) The State Water Board should consider amending water right permits for existing activities that reduce flow through the DWSC to require that the associated impacts on excess net oxygen demand conditions in the DWSC be evaluated and their impacts reduced in accordance with the *Control Program for Factors Contributing to the Dissolved Oxygen Impairment in the DWSC*.

- (2) The State Water Board should consider requiring evaluation and full mitigation of the potential impacts of future water right permits or water transfer applications on reduced flow and excess net oxygen demand conditions in the DWSC.

4.3.1.8 Delta Mercury

- (1) The State Water Board should consider requiring methylmercury controls for new water management activities that have the potential to increase ambient methylmercury levels as a condition of approval of any water right action required to implement the project. The State Water Board Division of Water Rights should consider requiring the evaluation and implementation of feasible management practices to reduce or, at a minimum, prevent methylmercury ambient levels from increasing from those changes in water management activities and flood conveyance projects that have the potential to increase methylmercury levels. The State Water Board should consider funding or conducting studies to develop and evaluate management practices to reduce methylmercury production resulting from existing water management activities or flood conveyance projects.
- (2) During future reviews of the salinity objectives contained in the Bay-Delta Plan, the State Water Board Division of Water Rights should consider conducting studies to determine whether proposed changes to salinity objectives could affect methylmercury production and should consider the results of these studies in evaluating changes to the salinity objectives.

4.3.2 Recommended for Implementation by Other Agencies

4.3.2.1 Water Resources Facilities

- (1) Consideration should be given to the construction of a storage facility to store surplus wet-weather Delta outflows. Construction should be contingent on studies demonstrating that some portion of wet-weather Delta outflow is truly surplus to the Bay-Delta system.
- (2) Consideration should be given to the use of excess capacity in west San Joaquin Valley conveyances, or of using a new east valley conveyance to:
 - (a) Augment flows and improve water quality in the San Joaquin River and southern Delta with the goal of achieving water quality as described in [Table 4-3](#).

TABLE 4-3

<u>TDS MG/L</u>	<u>TYPE PF YEAR¹</u>			
	<u>CRITICAL</u> ²	<u>DRY³</u>	<u>NORMAL</u>	<u>WET⁴</u>
Max. 3-day (arith. avg.)	500	500	500	500
Maximum (annual avg.)	385	385	385	285
Max. May-Sep (arith. avg.)	300	250	250	250
Max. 3-Day May-Sep (arith Avg.)	450	350	350	350
¹ Relative to unimpaired runoff to Delta Based on 1922 -1971 period. See definitions in Figure 2 of the 2006 Bay-Delta Plan ² Less than 57% , or less than 70% when preceding year critical ³ Less than 70%, or less than 90% when preceding year critical ⁴ Greater than 125%				

- (b) Prevent further ground water overdrafts and associated quality problems.
- (3) Agencies responsible for existing water resources facilities that reduce flow through the Stockton Deep Water Ship Channel (DWSC) should evaluate and reduce their impacts on excess net oxygen demand conditions in the DWSC in accordance with the *Control Program for Factors Contributing to the Dissolved Oxygen Impairment in the DWSC*.
- (4) Agencies responsible for future water resources facilities projects, which potentially reduce flow through the DWSC, should evaluate and fully mitigate the potential negative impacts on excess net oxygen demand conditions in the DWSC.

4.3.2.2 Agricultural Drainage Facilities

Facilities should be constructed to convey agricultural drain water from the San Joaquin and Tulare Basins. It is the policy of the Regional Water Board to encourage construction. The discharge must comply with water quality objectives of the receiving water body.

4.3.2.3 Subsurface Agricultural Drainage

- (1) The entire drainage issue is being handled as a watershed management issue. The entities in the Drainage Problem Area and entities within the remainder of the Grassland watershed need to establish a regional entity with authority and responsibility for drain water management.
- (2) The regional drainage entity and agricultural water districts should consider adopting economic incentive programs as a component of their plans to reduce pollutant loads. Economic incentives can be an effective institutional means of promoting on-farm changes in drainage and water management.
- (3) If fragmentation of the parties that generate, handle and discharge agricultural subsurface drainage jeopardizes the achievement of water quality objectives, the Regional Water Board will consider petitioning the Legislature for the formation of a regional drainage district.

- (4) The Legislature should consider putting additional bond issues before the voters to provide low interest loans for agricultural water conservation and water quality projects and incorporating provisions that would allow recipients to be private landowners, and that would allow irrigation efficiency improvement projects that reduce drainage discharges to be eligible for both water conservation funds and water quality facilities funds.
- (5) The San Joaquin Valley Drainage Implementation Program or other appropriate agencies should continue to investigate the alternative of a San Joaquin River Basin drain to move the existing discharge point for poor quality agricultural subsurface drainage to a location where its impact on water quality is less.
- (6) The selenium water quality objective for the wetland channels can not be achieved without removal of drainage water from these channels. The present use of the Grassland channels has developed over a 30-year period through agreements between the dischargers, water and irrigation districts, the U.S. Bureau of Reclamation, the California Department of Water Resources, the U.S. Fish and Wildlife Service, the California Department of Fish and Game (now the Department of Fish and Wildlife), the Grassland Water District and the Grassland Resource Conservation District. Because each entity shared in the development of the present drainage routing system, each shares the responsibility for implementation of a wetlands bypass.

4.3.2.4 Stockton Deep Water Ship Channel (DWSC)

- (1) The U.S. Army Corps of Engineers should reduce the impacts of the existing DWSC geometry on excess net oxygen demand conditions in accordance with the *Control Program for Factors Contributing to the Dissolved Oxygen Impairment in the DWSC*.

4.3.2.5 Delta Mercury

- (1) USEPA and the California Air Resources Board should work with the State Water Board and develop a memorandum of understanding to evaluate local and statewide mercury air emissions and deposition patterns and to develop a load reduction program(s).
- (2) The State of California should establish the means to fund a portion of the mercury control projects in the Delta and upstream watersheds.
- (3) Watershed stakeholders are encouraged to identify total mercury and methylmercury reduction projects and propose and conduct projects to reduce upstream non-point sources of methylmercury and total mercury. The Regional Water Board recommends that state and federal grant programs give priority to projects that reduce upstream non-point sources of methylmercury and total mercury.
- (4) Dischargers may evaluate imposed administrative civil liabilities projects for total mercury and methylmercury discharge and exposure reduction projects, consistent with Supplemental Environmental Project policies.

4.4 CONTINUOUS PLANNING FOR IMPLEMENTATION OF WATER QUALITY CONTROL

In order to effectively protect beneficial uses, the Regional Water Board updates the Basin Plan regularly in response to changing water quality conditions. The Regional Water Board is

periodically apprised of water quality problems in the Sacramento and San Joaquin River Basins, but the major review of water quality is done every three years as part of the Triennial Review of water quality standards.

During the triennial review, the Regional Water Board holds a public hearing to receive comments on actual and potential water quality problems. A workplan is prepared which identifies the control actions that will be implemented over the succeeding three years to address the problems. The actions may include or result in revision of the Basin Plan's water quality standards if that is an appropriate problem remedy. Until such time that a basin plan is revised, the triennial review also serves to reaffirm existing standards.

The control actions that are identified through the triennial review process are incorporated into the Basin Plan to meet requirements to describe actions (to achieve objectives) and a time schedule of their implementation as called for in the Water Code, Section 13242(a) and (b). The actions recommended in the most recent triennial review are described in the following section.

4.5 ACTIONS AND SCHEDULE TO ACHIEVE WATER QUALITY OBJECTIVES

4.5.1 Agricultural Drainage Discharges in the San Joaquin River Basin

Water quality in the San Joaquin River has degraded significantly since the late 1940s. During this period, salt concentrations in the River, near Vernalis, have doubled. Concentrations of boron, selenium, molybdenum and other trace elements have also increased. These increases are primarily due to reservoir development on the east side tributaries and upper basin for agricultural development, the use of poorer quality, higher salinity, Delta water in lieu of San Joaquin River water on west side agricultural lands and drainage from upslope saline soils on the west side of the San Joaquin Valley. Point source discharges to surface waters only contribute a small fraction of the total salt and boron loads in the San Joaquin River.

The water quality degradation in the River was identified in the 1975 Basin Plan and the Lower San Joaquin River was classified as a Water Quality Limited Segment. At that time, it was envisioned that a Valley-wide Drain would be developed and these subsurface drainage water flows would then be discharged outside the Basin, thus improving River water quality. However, present day development is looking more toward a regional solution to the drainage water discharge problem rather than a valley-wide drain.

Because of the need to manage salt and other pollutants in the River, the Regional Water Board began developing a Regional Drainage Water Disposal Plan for the Basin. The development began in FY 87/88 when Basin Plan amendments were considered by the Water Board in FY 88/89. The amendment development process included review of beneficial uses, establishment of water quality objectives, and preparation of a regulatory plan, including a full implementation plan. The regulatory plan emphasized achieving objectives through reductions in drainage volumes and pollutant loads through best management practices and other on-farm methods.

The 88/89 amendment emphasized toxic elements in subsurface drainage discharges. The Regional Water Board however still recognizes salt management as the most serious long-term issue on the San Joaquin River. Salinity impairment in the Lower San Joaquin River remains a persistent problem as salinity water quality objectives continue to be exceeded. The Regional Water Board adopted the following control program for salt and boron in the Lower San Joaquin River to address salt and boron impairment and to bring the river into compliance with water

quality objectives. Additionally, the Regional Water Board will continue as an active participant in the San Joaquin River Management Program implementation phase, as authorized by AB 3048, to promote salinity management schemes including time discharge releases, real time monitoring and source control.

Per the amendment to the Basin Plan for San Joaquin River subsurface agricultural drainage, approved by the State Water Board in Resolution No. 96-078, as amended by Resolution No. R5-2010-0046 and incorporated herein, the following actions will be implemented.

- (1) In developing control actions for selenium, the Regional Board will utilize a priority system which focuses on a combination of sensitivity of the beneficial use to selenium and the environmental benefit expected from the action.
- (2) Control actions which result in selenium load reduction are most effective in meeting water quality objectives.
- (3) With the uncertainty in the effectiveness of each control action, the regulatory program will be conducted as a series of short-term actions that are designed to meet long-term water quality objectives.
- (4) Best management practices, such as water conservation measures, are applicable to the control of agricultural subsurface drainage.
- (5) Performance goals will be used to measure progress toward achievement of water quality objectives for selenium. Prohibitions of discharge and waste discharge requirements will be used to control agricultural subsurface drainage discharges containing selenium. Compliance with performance goals and water quality objectives for nonpoint sources will occur no later than the dates specified in [Table 4-4](#) for Mud Slough (north) and the San Joaquin River from the Mud Slough confluence to the Merced River.

**TABLE 4-4. COMPLIANCE TIME SCHEDULE FOR MEETING THE 4-DAY
AVERAGE WATER QUALITY OBJECTIVE FOR SELENIUM**
Selenium Water Quality Objectives (in bold) and Performance Goals (in italics)

Water Body	31 December 2015	31 December 2019
Mud Slough (north) and the San Joaquin River from the Mud Slough confluence to the Merced River	<i>15 µg/L monthly mean</i>	5 µg/L 4-day avg.

- (6) Waste discharge requirements will be used to control agricultural subsurface drainage discharges containing selenium and may be used to control discharges containing other toxic trace elements.
- (7) Selenium load reduction requirements will be incorporated into waste discharge requirements as effluent limits as necessary to ensure that the selenium water quality objectives in the San Joaquin River downstream of the Merced River inflow is achieved. The Board adopted a TMDL for selenium in the San Joaquin River in 2001 after public review.

- (8) Selenium effluent limits established in waste discharge requirements will be applied to the discharge of subsurface drainage water from the Grassland watershed. In the absence of a regional entity to coordinate actions on the discharge, the Regional Board will consider setting the effluent limits at each drainage water source (discharger) to ensure that beneficial uses are protected at all points downstream.
- (9) Upslope irrigations and water facility operators whose actions contribute to subsurface drainage flows will participate in the program to control discharges.
- (10) Public and private managed-wetlands will participate in the program to achieve water quality objectives.
- (11) Achieving reductions in the load of selenium discharged is highly dependent upon the effectiveness of individual actions or technology not currently available; therefore, the Regional Board will review the waste discharge requirements and compliance schedule at least every 5 years.
- (12) All those discharging or contributing to the generation of agricultural subsurface drainage will be required to submit for approval a short-term (5-year) drainage management plan designed to meet interim milestones and a long-term drainage management plan designed to meet final water quality objectives.
- (13) An annual review of the effectiveness of control actions taken will be conducted by those contributing to the generation of agricultural subsurface drainage.
- (14) Evaporation basins in the San Joaquin Basin will be required to meet minimum design standards, have waste discharge requirements and be part of a regional plan to control agricultural subsurface drainage.
- (15) The Regional Board staff will coordinate with US EPA and the dischargers on a study plan to support the development of a site specific selenium water quality objective for the San Joaquin River and other effluent dominated waterbodies in the Grassland watershed.
- (16) The Regional Board will establish water quality objectives for salinity for the San Joaquin River.

4.5.1.1 Control program for Salt and Boron Discharges into the Lower San Joaquin River (LSJR)

The goal of the salt and boron control program is to achieve compliance with salt and boron water quality objectives without restricting the ability of dischargers to export salt out of the San Joaquin River basin.

For the purpose of this control program, nonpoint source land uses include all irrigated lands and nonpoint source discharges are discharges from irrigated lands.

Irrigated lands are lands where water is applied for producing crops and, for the purpose of this control program, includes, but is not limited to, land planted to row, field and tree crops as well as commercial nurseries, nursery stock production, managed wetlands, and rice production.

This control program is phased to allow for implementation of existing water quality objectives, while providing the framework and timeline for implementing future water quality objectives.

The salt and boron control program establishes salt load limits to achieve compliance at the Airport Way Bridge near Vernalis with salt and boron water quality objectives for the LSJR. The Regional Water Board establishes a method for determining the maximum allowable salt loading to the LSJR. Load allocations are established for nonpoint sources and waste load allocations are established for point sources.

Load allocations to specific dischargers or groups of dischargers are proportionate to the area of nonpoint source land use contributing to the discharge. Control actions that result in salt load reductions will be effective in the control of boron.

The salt and boron control program establishes timelines for: 1) developing and adopting salt and boron water quality objectives for the San Joaquin River upstream of the Airport Way Bridges near Vernalis; 2) a control program to achieve these objectives; and 3) developing and adopting a groundwater control program.

Per the amendment to the Basin Plan for control of salt and boron discharges into the lower San Joaquin River (LSJR) basin, approved by the Regional Water Board in Resolution No. 2004-0108 and incorporated herein, the Regional Water Board will take the following actions, as necessary and appropriate, to implement this control program:

- (1) The Regional Water Board shall use waivers of waste discharge requirements or waste discharge requirements to apportion load allocations to each of the following seven geographic subareas that comprise the LSJR:
 - (a) San Joaquin River Upstream of Salt Slough
 - (b) Grassland
 - (c) Northwest Side
 - (d) East Valley Floor
 - (e) Merced River
 - (f) Tuolumne River
 - (g) Stanislaus River

These subareas are described in Chapter 1 and in more detail in Appendix 41.

- (2) Dischargers of irrigation return flows from irrigated lands are in compliance with this control program if they meet any of the following conditions:
 - (a) Cease discharge to surface water
 - (b) Discharge does not exceed 315µS/cm electrical conductivity (based on a 30-day running average)
 - (c) Operate under waste discharge requirements that include effluent limits for salt
 - (d) Operate under a waiver of waste discharge requirements for salt and boron discharges to the LSJR
- (3) The Regional Water Board will adopt a waiver of waste discharge requirements for salinity management, or incorporate into an existing agricultural waiver, the conditions required to participate in a Regional Water Board approved real-time management

program. Load allocations for nonpoint source dischargers participating in a Regional Water Board approved real-time management program are described in [Table 4-8](#). Additional waiver conditions will include use of Regional Water Board approved methods to measure and report flow and electrical conductivity. Participation in a Regional Water Board approved real-time management program and attainment of salinity and boron water quality objectives will constitute compliance with this control program.

- (4) The Regional Water Board will adopt waste discharge requirements with fixed monthly base load allocations specified as effluent limits for nonpoint source discharges that do not meet conditions specified in a waiver of waste discharge requirements for salinity management. Entities operating under WDRs or that will be required to operate under WDRs in order to comply with other programs, may participate in a Regional Water Board approved real-time management program in lieu of additional WDRs for salinity if they meet the conditions specified in the waiver of WDRs for salinity management, as described in item 3.
- (5) Fixed monthly base load allocations and the method used to calculate real-time load allocations are specified in [Table 4-8](#).
- (6) Waste Load Allocations are established for point sources of salt in the basin. NPDES permitted discharges will not exceed the salinity water quality objectives established for the LSJR at the Airport Way Bridge near Vernalis. The Regional Water Board will revise NPDES permits to incorporate TMDL allocations when the permits are renewed or reopened at the discretion of the Regional Water Board
- (7) Supply water credits are established for irrigators that receive supply water from the Delta Mendota Canal (DMC) or the LSJR between the confluence of the Merced River and the Airport Way Bridge near Vernalis as described in [Table 4-8](#).
- (8) Supply water Load Allocations are established for salts in irrigation water imported to the LSJR Watershed from the Sacramento/San Joaquin River Delta as described in [Table 4-8](#).

The Regional Water Board will attempt to enter into a Management Agency Agreement (MAA) with the U.S. Bureau of Reclamation to address salt imports from the DMC to the LSJR watershed. The MAA shall include provisions requiring the U.S. Bureau of Reclamation to:

- (a) Meet DMC load allocations; or
- (b) Provide mitigation and/or dilution flows to create additional assimilative capacity for salt in the LSJR equivalent to DMC salt loads in excess of their allocation

The Regional Water Board shall request a report of waste discharge from the U.S. Bureau of Reclamation to address DMC discharges if a MAA is not established by 28 July 2008.

- (9) The Regional Water Board will review and update the load allocations and waste load allocations by 28 July 2012 and every 6 years thereafter. Any changes to waste load allocations and/or load allocations can be made through subsequent amendment to this control program. Changes to load allocations will be implemented through revisions of the applicable waste discharge requirements or waivers of waste discharge requirements. Changes to waste load allocations will be implemented through revisions of the applicable NPDES permits.

- (10) The Regional Water Board encourages real-time water quality management and pollutant trading of waste load allocations, load allocations, and supply water allocations as a means for attaining salt and boron water quality objectives while maximizing the export of salts out of the LSJR watershed. This control program shall in no way preclude basin-wide stakeholder efforts to attain salinity water quality objectives in the LSJR so long as such efforts are consistent with the control program.
- (11) The established waste load allocations, load allocations, and supply water allocations represent a maximum allowable level. The Regional Water Board may take other actions or require additional reductions in salt and boron loading to protect beneficial uses
- (12) Salt loads in water discharged into the LSJR or its tributaries for the express purpose of providing dilution flow are not subject to load limits described in this control program if the discharge:
- (a) complies with salinity water quality objectives for the LSJR at the Airport Way Bridge near Vernalis;
 - (b) is not a discharge from irrigated lands; and
 - (c) is not provided as a water supply to be consumptively used upstream of the San Joaquin River at the Airport Way Bridge near Vernalis.
- (13) Entities providing dilution flows, as described in item 12, will obtain an allocation equal to the salt load assimilative capacity provided by this flow. This dilution flow allocation can be used to: 1) offset salt loads discharged by this entity in excess of any allocation or; 2) trade, as described in item 10. The additional dilution flow allocation provided by dilution flows will be calculated as described in [Table 4-8](#).
- (14) It is anticipated that salinity and boron water quality objectives for the San Joaquin River from Mendota Dam to the Airport Way Bridge near Vernalis will be developed and considered for adoption in the second phase of this TMDL, according to time schedule in [Table 4-5](#).

TABLE 4-5: SCHEDULE FOR DEVELOPING WATER QUALITY OBJECTIVES FOR SALT AND BORON IN THE LSJR FROM MENDOTA DAM TO THE AIRPORT WAY BRIDGE NEAR VERNALIS

Milestone	Date
Staff report on criteria needed to protect beneficial uses	October 2004
Staff report and Regional Water Board workshop on water quality objectives that can reasonably be achieved	June 2005
Draft second phase TMDL with water quality objectives and program of implementation for LSJR from Mendota Dam to Airport Way Bridge near Vernalis	September 2005
Board Hearing for consideration of adoption	June 2006

- (15) Salinity and boron water quality objectives for the San Joaquin River from Mendota Dam to the Airport Way Bridge near Vernalis will be implemented using the implementation framework described in this 'Control Program for Salt and Boron Discharges into the Lower San Joaquin River' or other implementation mechanisms, as appropriate.

- (16) A groundwater control program for sources of salt discharges into the LSJR will be developed by June 2020 if water quality objectives in the LSJR are not being attained.

4.5.1.1.1 Implementation Priority

- (17) The Regional Water Board will focus control actions on the most significant sources of salt and boron discharges to the LSJR. Priority for implementation of load allocations to control salt and boron discharges will be given to subareas with the greatest unit area salt loading (tons per acre per year) to the LSJR ([Table 4-6](#)).

The priorities established in [Table 4-6](#) will be reviewed by 28 July 2012 and every 6 years thereafter.

TABLE 4-6: PRIORITIES FOR IMPLEMENTING LOAD ALLOCATIONS¹

Subarea	Priority
San Joaquin River Upstream of Salt Slough	Low
Grassland	High
Northwest Side	High
East Valley Floor	Low
Merced River	Low
Tuolumne River	Medium
Stanislaus River	Low
Delta Mendota Canal ²	High
¹ Priorities based on the unit area salt loading from each subarea and mass load from the DMC	
² Delta Mendota Canal is not a subarea	

4.5.1.1.2 Time Schedules for Implementation

- (18) The Regional Water Board will incorporate base load allocations into waste discharge requirements and real-time load allocations into conditions of waiver of waste discharge requirements by 28 July 2008. Dischargers regulated under a waiver of waste discharge requirements for dischargers participating in a real-time management program for the control of salt and boron in the LSJR shall comply with the waiver conditions within 1 year of the date of adoption of the waiver.
- (19) Existing NPDES point source dischargers are low priority and subject to the compliance schedules for low priority discharges in [Table 4-7](#). New point source discharges that begin discharging after the date of the adoption of this control program must meet the requirements of the Control Program for Salt and Boron Discharges into the Lower San Joaquin River upon the commencement of the discharge.

**TABLE 4-7: SCHEDULE FOR COMPLIANCE WITH THE LOAD ALLOCATIONS
FOR SALT AND BORON DISCHARGES INTO THE LSJR**

Priority	Year to implement ¹	
	Wet through Dry Year Types	Critical Year Types
High	8	12
Medium	12	16
Low	16	20
¹ number of years from the effective date [28 July 2006] of this control program		

TABLE 4-8 SUMMARY OF ALLOCATIONS AND CREDITS

BASE SALT LOAD ALLOCATIONS													
Base Load Allocations (thousand tons of salt)													
Year-type ¹	Month / Period												
	Jan	Feb	Mar	Apr 1 to Apr. 14	Pulse Period ²	May 16 to May 31	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wet	41	84	116	23	72	31	0	0	5	45	98	44	36
Abv. Norm	44	84	64	26	71	14	0	0	0	44	58	35	32
Blw. Norm	22	23	31	11	45	8	0	0	0	38	41	34	30
Dry	28	39	25	5	25	1	0	0	0	25	31	27	28
Critical	18	15	11	0	0	0	0	0	0	19	30	26	23
REAL-TIME SALT LOAD ALLOCATIONS													
<p>Nonpoint source dischargers operating under waiver of waste discharge requirements must participate in a Regional Water Board approved real-time management program and meet real-time load allocations. Loading capacity and real-time load allocations are calculated for a monthly time step. The following method is used to calculate real-time load allocations. Flows are expressed in thousand acre-feet per month and loads are expressed in thousand tons per month.</p>													
<p>Loading Capacity (LC) in thousand tons per month is calculated by multiplying flow in thousand acre-ft per month by the salinity water quality objective in $\mu\text{S}/\text{cm}$, a unit conversion factor of 0.8293, and a coefficient of 0.85 to provide a 15 percent margin of safety to account for any uncertainty.</p>													
$\text{LC} = \text{Q} * \text{WQO} * 0.8293 * 0.85$													
Where:													
LC = total loading capacity in thousand tons per month													
Q = flow in the San Joaquin River at the Airport way Bridge near Vernalis in thousand acre-feet per month													
WQO = salinity water quality objective for the LSJR at Airport Way Bridge near Vernalis in $\mu\text{S}/\text{cm}$													

TABLE 4-8 SUMMARY OF ALLOCATIONS AND CREDITS (continued)

The sum of the real-time Load Allocations (LA) for nonpoint source dischargers are equal to a portion of the LSJR's total Loading Capacity (LC) as described by the following equation:

$$LA = LC - L_{BG} - L_{CUA} - L_{GW} - \Sigma WLA$$

Where:

LA = sum of the real-time Load Allocations for nonpoint source dischargers

L_{BG} = loading from background sources

L_{CUA} = consumptive use allowance

L_{GW} = loading from groundwater

ΣWLA = sum of the waste load allocations for all point sources

Background loading in thousand tons is calculated using the following equation:

$$L_{BG} = Q * 85 \mu S/cm * 0.8293$$

Consumptive use allowance loading is calculated with the following equation:

$$L_{CUA} = Q * 230 \mu S/cm * 0.8293$$

Monthly groundwater Loading (L_{GW}) (in thousand tons)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
15	15	30	32	36	53	46	27	16	13	14	15

Waste load allocations for individual point sources are calculated using the following equation:

$$WLA = Q_{PS} * WQO * 0.8293$$

where:

WLA = waste load allocation in thousand tons per month

Q_{PS} = effluent flow to surface waters from the NPDES permitted point source discharger (in thousand acre-feet per month)

WQO = salinity water quality objective for the LSJR at Airport Way Bridge near Venalis in $\mu S/cm$

APPORTIONING OF SALT LOAD ALLOCATION

An individual discharger or group of dischargers can calculate their load allocation by multiplying the nonpoint source acreage drained by the load allocation per acre.

$$LA \text{ per acre} = \frac{LA}{\text{Total nonpoint source acreage}}$$

As of 1 August 2003, the total nonpoint source acreage of the LSJR Basin is 1.21-million acres. Nonpoint source land uses include all irrigated agricultural lands (including managed wetlands). Agricultural land includes all areas designated as agricultural or semi-agricultural land uses in the most recent land use surveys published by the California Department of Water Resources. California Department of Water Resources land use surveys are prepared and published on a county-by-county basis. Multiple counties or portions of counties may overlay a given subarea. The land use surveys must be used in combination with a Geographic Information System to quantify the agricultural land use in each subarea. Nonpoint source land areas will be updated every 6 years through an amendment to the Basin Plan if updated California Department of Water Resources land use surveys have been published. The following land use surveys (or portions thereof) are used to quantify agricultural land use in the LSJR watershed.

TABLE 4-8 SUMMARY OF ALLOCATIONS AND CREDITS (continued)**APPORTIONING OF SALT LOAD ALLOCATION (continued)**

County	Year of most recent land use survey ¹
Merced	1995
Madera	1995
San Joaquin	1996
Fresno	1994
Stanislaus	1996
¹ -as of 1 August 2003	

Acreage of managed wetlands is based on the boundaries of the federal, private and state owned wetlands that comprise the Grassland Ecological Area in Merced County. Agricultural lands (as designated in DWR land uses surveys) within the Grassland Ecological Area are counted as a agricultural land use and not as managed wetlands. All other lands within the Grassland Ecological Area are considered to be managed wetlands.

CONSUMPTIVE USE ALLOWANCE

In addition to the base load allocations or real-time load allocations shown above, a consumptive use allowance (L_{CUA}) is provided to each discharger:

$$L_{CUA} \text{ in tons per month} = \text{discharge volume acre-feet per month} * 230 \mu\text{S/cm} * 0.8293$$

SUPPLY WATER CREDITS

A supply water credit is provided to irrigators in the Grassland and Northwest Side Subareas that receive water from the DMC. This DMC supply water credit is equal to 50 percent of the added salt load, in excess of background, delivered to Grassland and Northwest Side subareas. The following fixed DMC supply water credits apply to dischargers operating under base load allocations:

DMC supply water credits (thousand tons)

Year-type ¹	Month / Period												
	Jan	Feb	Mar	Apr 1 to Apr. 14	Pulse Period ²	May 16 to May 31	Jun	Jul	Aug	Sep	Oct	Nov	Dec
NORTHWEST SIDE SUBAREA													
Wet	0.0	0.2	0.0	0.7	1.4	0.7	2.0	2.6	2.6	1.0	0.9	0.6	0.0
Abv. Norm	0.0	0.0	0.0	0.8	1.9	1.0	2.3	2.3	2.6	1.2	0.8	0.3	0.0
Blw. Norm	0.0	0.0	0.0	1.0	2.6	1.5	3.4	4.2	3.3	2.5	1.9	0.8	0.0
Dry	0.0	0.0	0.0	0.1	0.3	0.2	0.3	0.5	0.5	0.2	0.2	0.0	0.0
Critical	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GRASSLAND SUBAREA													
Wet	2.1	5.9	13.9	7.8	17.3	8.8	22.6	20.8	23.2	17.2	16.0	10.4	3.7
Abv. Norm	1.2	4.8	9.4	10.4	24.7	13.6	27.6	20.3	24.5	23.9	16.6	7.5	2.6
Blw. Norm	1.4	5.7	13.8	12.5	29.5	15.9	32.6	29.2	29.8	32.9	25.3	12.8	4.5
Dry	2.2	6.7	15.9	11.1	23.4	11.2	22.9	23.1	24.0	28.0	23.7	13.0	5.3
Critical	3.3	8.9	17.2	10.2	24.1	13.3	33.3	32.5	31.8	27.5	28.7	13.6	5.9

TABLE 4-8 SUMMARY OF ALLOCATIONS AND CREDITS (continued)

The following method is used to calculate real-time DMC supply water credits in thousand tons per month and applies to dischargers operating under real-time load allocations.

$$\text{Real-time CVP Supply Water Credit} = Q_{\text{CVP}} * (C_{\text{CVP}} - C_{\text{BG}}) * 0.8293 * 0.5$$

Where:

Q_{CVP} = volume of water delivered from CVP in thousand acre-feet per month³

C_{CVP} = electrical conductivity of water delivered from CVP in $\mu\text{S}/\text{cm}^3$

C_{BG} = background electrical conductivity of 85 $\mu\text{S}/\text{cm}$

For irrigators in the Northwest Side Subarea an additional supply water credit is provided to account for salts contained in supply water diverted directly from the LSJR (LSJR diversion water credit). The LSJR diversion credit is equal to 50 percent of the added salt load (in excess of background) in supply water diverted from the San Joaquin River between the confluence of the Merced River and the Airport Way Bridge near Vernalis. The following fixed LSJR supply water credits apply to dischargers operating under base load allocations:

LSJR supply water credits (thousand tons)

Year-type ¹	Month / Period												
	Jan	Feb	Mar	Apr 1 to Apr. 14	Pulse Period ²	May 16 to May 31	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wet	0.0	0.6	9.2	6.2	9.4	11.0	17.2	23.5	20.5	9.5	1.3	0	0
Abv. Norm	0.0	0.8	5.0	7.4	12.3	11.2	21.8	24.9	20.3	10.7	1.5	0	0
Blw. Norm	0.0	0.6	5.5	7.0	14.4	13.4	27.3	33.1	24.9	13.9	2.4	0	0
Dry	0.0	0.7	5.3	6.4	11.1	10.7	27.5	34.0	20.3	11.4	2.4	0	0
Critical	0.0	0.8	4.5	5.1	14.8	10.6	25.2	28.5	22.3	8.7	2.5	0	0

The following method is used to calculate Real-time LSJR supply water credits in thousand tons per month and applies to dischargers operating under real-time load allocations.

$$\text{Real-time LSJR Supply Water Credit} = Q_{\text{LSJR DIV}} * (C_{\text{LSJR DIV}} - C_{\text{BG}}) * 0.8293 * 0.5$$

Where:

$Q_{\text{LSJR DIV}}$ = volume of water diverted from LSJR between the Merced River Confluence and the Airport Way Bridge near Vernalis in thousand acre-feet per month⁴

$C_{\text{LSJR DIV}}$ = electrical conductivity of water diverted from the LSJR in $\mu\text{S}/\text{cm}^4$

C_{BG} = background electrical conductivity of 85 $\mu\text{S}/\text{cm}$

SUPPLY WATER ALLOCATIONS

The U.S. Bureau of Reclamation DMC load allocation (LA_{DMC}) is equal to the volume of water delivered from the DMC (Q_{DMC}) to the Grassland and Northwest side Subareas at a background Sierra Nevada quality of 85 $\mu\text{S}/\text{cm}$.

$$LA_{\text{DMC}} = Q_{\text{DMC}} * 85 \mu\text{S}/\text{cm} * 0.8293$$

TABLE 4-8 SUMMARY OF ALLOCATIONS AND CREDITS (continued)

DILUTION FLOW ALLOCATIONS
<p>Entities providing dilution flows obtain an allocation equal to the salt load assimilative capacity provided by this flow, calculated as follows:</p> $A_{dil} = Q_{dil} * (C_{dil} - WQO) * 0.8293$ <p>Where:</p> <p>A_{dil} = dilution flow allocation in thousand tons of salt per month</p> <p>Q_{dil} = dilution flow volume in thousand acre-feet per month</p> <p>C_{dil} = dilution flow electrical conductivity in $\mu\text{S/cm}$</p> <p>WQO = salinity water quality objective for the LSJR at Airport Way Bridge near Vernalis in $\mu\text{S/cm}$</p> <p>¹ The water year classification will be established using the best available estimate of the 60-20-20 San Joaquin Valley water year hydrologic classification (as defined in Footnote 17 for Table 3 in the State Water Resources Control Board's <i>Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary</i>, May 1995) at the 75% exceedance level using data from the Department of Water Resources Bulletin 120 series. The previous water year's classification will apply until an estimate is made of the current water year.</p> <p>² Pulse period runs from 4/15-5/15. Period and distribution of base load allocation and supply water credits between April 1 and May 31 may change based on scheduling of pulse flow as specified in State Water Board Water Rights Decision 1641. Total base load allocation for April 1 through May 31 does not change but will be redistributed based on any changes in the timing of the pulse period</p> <p>³ Methods used to measure and report the volume and electrical conductivity of water delivered from the CVP to irrigated lands must be approved by the Regional Water Board as part of the waiver conditions required to participate in a Regional Water Board approved real-time management program</p> <p>⁴ Methods used to measure and report the volume and electrical conductivity of water diverted from the SJR between the confluence of the Merced and the Airport Way Bridge near Vernalis must be approved by the Regional Water Board as part of the waiver conditions required to participate in a Regional Water Board approved real-time management program</p>

4.5.2 Assessment of Biotoxicity of Major Point and Nonpoint Source Discharges in the Sacramento River and San Joaquin River Basins

In addition to numerical water quality objectives for toxicity, the Basin Plan contains a narrative water quality objective that requires all surface waters to "...be maintained free of toxic substances in concentrations that are toxic to or that produce detrimental physiological responses to human, plant, animal, and aquatic life." To check for compliance with this objective, the Regional Water Board initiated a biotoxicity monitoring program to assess toxic impacts from point and nonpoint sources in FY 86-87.

Toxicity testing monitoring requirements have been placed in NPDES permits, as appropriate. Since 1986-87, ambient toxicity testing (coupled with water quality chemistry to identify toxic

constituents) has been concentrated in the Delta and major tributaries. The Regional Water Board will continue to impose toxicity testing monitoring requirements in NPDES permits. The focus of ambient toxicity testing will continue to be the Delta and major tributaries.

4.5.3 Heavy Metals From Point and Nonpoint Sources

Heavy metals such as copper, zinc, mercury, lead, and cadmium impair beneficial uses of surface streams. These metals result from various point and nonpoint sources throughout the region, including mines, urban runoff, agriculture, and wastewater treatment plants. Discharges from abandoned or inactive mines, particularly in the Sacramento River watershed, severely impair local receiving waters. Available information suggests that such mines are by far the largest contributors of copper, zinc, and cadmium to surface waters in the Sacramento and San Joaquin River Basins.

Because the Delta and San Francisco Bay receive all upstream inputs, the effects of heavy metals may be focused on these water bodies. Although the relationship between cause and effect remains unclear, heavy metals have been implicated as a cause of problems in Delta biota (e.g., there is a health advisory limiting the consumption of striped bass because of elevated levels of mercury) and copper objectives have been exceeded in the Bay. Problems in the Bay and Delta are related to the effects of total metals loadings and dissolved metals concentrations.

The Regional Water Board plans to develop a mass emission strategy to control the loads of metals entering receiving waters and the Delta. Although the strategy will focus on control of discharges from inactive and abandoned mines, reasonable steps will also be taken to limit loads of metals from other significant sources. The Regional Water Board also plans to continue to monitor for metals in the Delta and principal tributaries to the Delta to assess compliance with water quality objectives, to assess impacts on beneficial uses, and to coordinate monitoring and metal reduction programs with the San Francisco Regional Water Quality Control Board.

Where circumstances warrant, the Regional Water Board will support action to clean up and abate pollution from identified sources. Funds from the State Water Pollution Cleanup and Abatement Account have been and are being used to clean up and abate discharges from selected abandoned or inactive mines. Abatement projects are underway at Iron Mountain Mine, Walker Mine, Mammoth Mine, Balaklala Mine, Keystone Mine, Stowell Mine, and Penn Mine, as data show that these mines are the most significant sources in terms of total metals discharged to receiving waters.

However, recent judicial decisions have imposed liability on the Regional Water Board for its cleanup actions at the Penn Mine. As long as the risk of such liability exists, the Regional Water Board will likely choose not to perform cleanup at any additional sites. Action by the State Legislature or the Congress will probably be required to resolve concerns of liability and facilitate the State's role in site remediation.

The Regional Water Board also will seek additional resources to update the Regional Abandoned Mines Inventory, to establish a monitoring program to track metals across the Delta and into the Bay, and to determine what loads the Delta can assimilate without resulting in adverse impacts. Although most of the significant mine portal discharges are in the process of being controlled, others need studies to determine their potential for cleanup. Since a major uncharacterized source of metals are the tailings piles associated with the mines, studies are needed to define the loads from these sources in order to establish priorities for abatement activities.

4.5.4 Mercury Discharges in the Sacramento River and San Joaquin River Basins

Mercury problems are evident region-wide. The main concern with mercury is that, like selenium, it bioaccumulates in aquatic systems to levels that are harmful to fish and their predators. Health advisories have been issued which recommend limiting consumption of fish taken from the Bay/Delta, Clear Lake, Lake Berryessa, Black Butte Reservoir, Lake Pillsbury, and Marsh Creek Reservoir. Concentrations of mercury in other water bodies approach or exceed National Academy of Science (NAS), U.S. Environmental Protection Agency (EPA), and/or U.S. Food and Drug Administration (FDA) guidelines for wildlife and human protection. In addition to these concerns, fish-eating birds taken from some bodies of water in the Basins have levels of mercury that can be expected to cause toxic effects. Bird-kills from mercury also have been documented in Lake Berryessa. (There is also concern for birds in the Delta, but no studies have been completed.) The Regional Water Board has done a preliminary assessment of the mercury situation in the Central Valley Region and concluded that the problem is serious and remedies will be complex and expensive.

The short-term strategy is to concentrate on correcting problems at upstream sites while monitoring the Delta to see whether upstream control activities measurably benefit the Delta. The Regional Water Board will support efforts to fund the detailed studies necessary to define assimilative capacity and to fully define uptake mechanisms in the biota.

In the next few years monitoring is scheduled to be done in the Delta and at upstream sources. The Regional Water Board will continue to support efforts to study how mercury is cycled through the Delta and to further characterize upstream sources.

4.5.4.1 Clear Lake Mercury

The Regional Water Board has a goal to reduce methylmercury concentrations in Clear Lake fish by reducing total mercury loads from various sources within the Clear Lake watershed.

Sources of mercury include past and present discharges from the Sulphur Bank Mercury Mine (SBMM) site, small mercury mines and geothermal sources, natural and anthropogenic erosion of soils with naturally occurring mercury, and atmospheric deposition. The goal of the Clear Lake mercury management strategy is to reduce fish tissue methylmercury concentrations by 60% of existing levels. This will be accomplished by reducing the concentration of total mercury in the surficial layer of lakebed sediment by 70% of existing levels and by further investigation and reduction of other mercury sources believed to have a high potential for mercury methylation. Through a complex process, total mercury is methylated and becomes bioavailable to organisms in the food web. The linkage between (1) the total mercury in the sediments derived from various sources and other sources of total mercury and (2) the concentration of methylmercury in ecological receptors, is complicated and subject to uncertainty. As additional information about these relationships becomes available, the Regional Water Board will revise and refine as appropriate the load allocation and implementation strategy to achieve fish tissue objectives.

4.5.4.1.1 Mercury Load Allocations

The strategy for meeting the fish tissue objectives is to reduce the inputs of mercury to the lake from tributaries and the SBMM site, combined with active and passive remediation of contaminated lake sediments. The load allocations for Clear Lake will result in a reduction in the overall mercury sediment concentration by 70% of existing concentrations. The load allocations

are assigned to the active sediment layer of the lakebed, the SBMM terrestrial site, the tributary creeks and surface water runoff to Clear Lake, and atmospheric deposition. [Table 4-9](#) summarizes the load allocations. The load allocation to the active sediment layer is expressed as reducing concentrations of total mercury in the active sediment layer to 30% of current concentrations. The load allocation to the SBMM terrestrial site is 5% of the ongoing loads from the terrestrial mine site. The load allocation for the mine also includes reducing mercury concentrations in surficial sediment to achieve the sediment compliance goals for Oaks Arm shown in [Table 4-10](#). The load allocation to tributary and surface water runoff is 80% of existing loads. These load allocations account for seasonal variation in mercury loads, which vary with water flow and rainfall. The analysis includes an implicit margin of safety in the reference doses for methylmercury that were used to develop the fish tissue objectives. It also includes an explicit margin of safety of 10% to account for uncertainty in the relationship between fish tissue concentrations and loads of total mercury. The reductions in loads of total mercury from all sources are expected to result in attainment of water quality objectives.

**TABLE 4-9
MERCURY LOAD ALLOCATIONS**

Mercury Source	Allocation
Clear Lake Sediment	30% of existing concentration
Sulphur Bank Mine	5% of existing load
Tributaries	80% of existing load
Atmosphere	No change

4.5.4.1.2 *Sulphur Bank Mercury Mine*

Reducing mercury concentrations in surficial sediment by 70% is an overall goal for the entire lake. To achieve water quality objectives, extremely high levels of mercury in the eastern end of Oaks Arm near SBMM must be reduced by more than 70%. To evaluate progress in lowering sediment concentrations, the following sediment compliance goals are established at sites that have been sampled previously.

Current and past releases from the Sulphur Bank Mercury Mine are a significant source of total mercury loading to Clear Lake. Ongoing annual loads from the terrestrial mine site to the lakebed sediments occur through groundwater, surface water, and atmospheric routes. Loads from ongoing releases from the terrestrial mine site should be reduced to 5% of existing inputs. Because of its high potential for methylation relative to mercury in lakebed sediments, mercury entering the lake through groundwater from the mine site should be reduced to 0.5 kg/year.

Past releases from the mine site are a current source of exposure through remobilization of mercury that exists in the lakebed sediments as a result of past releases to the lake from the terrestrial mine site. Past active mining operations, erosion and other mercury transport processes at SBMM have contaminated sediment in Oaks Arm. The load allocation assigned to SBMM includes reducing surficial sediment concentrations in Oaks Arm by 70% (more at sites nearest the mine site) to meet the sediment compliance goals in [Table 4-10](#).

In 1990, the U.S. Environmental Protection Agency (USEPA) placed Sulphur Bank Mercury Mine on the National Priorities List under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). The USEPA has already performed remediation actions to stabilize waste rock piles, reduce erosion, and control surface water on the site.

TABLE 4-10
SEDIMENT COMPLIANCE GOALS FOR MERCURY IN CLEAR LAKE

Site Designation	Location	Sediment Mercury Goal (a) (mg/kg dry weight)
Upper Arm UA-03	Center of Upper Arm on transect from Lakeport to Lucerne	0.8
Lower Arm LA-03	Center of Lower Arm, North and west of Monitor Point	1
Oaks Arm		
OA-01 (c)	0.3 km from SBMM	16 (b)
OA-02 (c)	0.8 km from SBMM	16 (b)
OA-03 (c)	1.8 km from SBMM	16
OA-04 (c)	3 km from SBMM	10
Narrows O1	7.7 km from SBMM	3

(a) Sediment goals are 30% of existing concentrations. Existing concentrations are taken as the average mercury concentrations in samples collected in 1996-2000 (Clear Lake Basin Plan Amendment Staff Report).

(b) Due to the exceptionally high concentrations existing at the eastern end of Oaks Arm, sediment goals at OA-01 and OA-02 are not 70% of existing concentrations. These goals are equal to the sediment goal established for OA-03.

(c) Sediment goal is part of the load allocation for SBMM.

Estimates of the current annual loads from the terrestrial mine site to the surficial lakebed sediment are under investigation. Existing data indicate that loads of total mercury from the terrestrial mine site are within a broad range of 1 to 568 kg mercury per year. New data may be used to refine the load estimates as discussed below. As part of verifying compliance with the load allocations, remediation activities to address current and past releases from SBMM should be conducted to meet the sediment compliance goals listed in [Table 4-10](#) for sediments within one kilometer of the mine site, specifically at sites OA-01 and OA-02.

The Regional Water Board anticipates that fish tissue objectives for mercury will not be met unless the load reductions from Sulphur Bank Mercury Mine are attained.

The Regional Water Board will request that USEPA continue remediation activities on the mine site and prepare an implementation plan or plans that address the following: reduction of ongoing releases of mercury from the SBMM site through surface water, groundwater, and the atmosphere; necessary remediation for mercury in lakebed sediments previously deposited through mining, erosion, and other processes at the mine site; and monitoring and review activities. The implementation plans should provide interim sediment goals and explain how control actions will assist in achieving fish tissue objectives for mercury in Clear Lake. The Regional Water Board will request that USEPA submit remediation plans for Regional Board approval for the SBMM site within eight years after the effective date of this amendment and implement the plan two years thereafter. USEPA should complete remediation activities at the mine site and active lakebed sediment remediation within ten years of plan implementation.

USEPA anticipates implementing additional actions to address the ongoing surface and groundwater releases from the SBMM over the next several years. These actions are expected to lead to significant reductions in the ongoing releases from the mine pit, the mine waste piles and other ongoing sources of mercury releases from the terrestrial mine site. USEPA also currently plans to investigate what steps are appropriate under CERCLA to address the existing contamination in the lakebed sediments due to past releases from the SBMM. Regional Water Board staff will continue to work closely with the USEPA on these important activities. In addition, Regional Water Board staff will coordinate monitoring activities to investigate other sources of mercury loads to Clear Lake. These investigations by USEPA and the Regional Water Board should reduce the uncertainty that currently exists regarding the annual load of total mercury to the lake, the contribution of each source to that load, and the degree to which those sources lead to methylmercury exposure to and mercury uptake by fish in the lake. This information should lead to more refined decisions about what additional steps are appropriate and feasible to achieve the applicable water quality criteria.

The sediment compliance goals for Oaks Arm will require USEPA to address both (1) the ongoing releases from the terrestrial mine site and (2) the load of total mercury that currently exists in the active lakebed sediment layer as a result of past releases. Potential options to control the ongoing releases of mercury from the terrestrial mine site include: remediation of onsite waste rock, tailings and ore piles to minimize the erosion of mercury contaminated sediments into the lake; diversion of surface water run-on away from waste piles and the inactive mine pit; control and containment or treatment of surface water runoff; control of groundwater flow into Clear Lake; and reduction of mercury flux from the mine waste piles into the atmosphere.

Meeting the load allocation for the lakebed sediment will require remediation of contaminated sediment. Potential options to address the mercury that currently exists in the lakebed as a result of past releases and is being remobilized may include dredging the contaminated sediment, capping with clean sediments, facilitating natural burial of highly contaminated sediments, or reducing the transport of highly contaminated sediments from the Oaks Arm into the rest of the lake. Monitoring to assess progress toward meeting the load reduction goals from Sulphur Bank Mercury Mine should be planned and conducted as part of specific remediation activities. Baselines for mercury loads from the various ongoing inputs from the mine site should be established in order to evaluate successes of the remediation activities.

In order to refine the load estimates from SBMM, the Regional Water Board recommends that USEPA determine the following information: mercury concentrations and sediment deposition rates for sediment cores collected near the mine site; characterization of porewater in sediments near the mine site to determine sources, magnitude and impacts of mercury-containing fluids/groundwater entering the lake; estimates of total surface water and groundwater fluxes of mercury from SBMM, including transport through the wetlands north of the site; and patterns of sediment transport and deposition within the lake.

If additional information reveals that reaching the 95% reduction in mercury loads from the terrestrial mine site is technically infeasible or cost prohibitive, or otherwise not technically justified, the Regional Water Board will consider internal adjustments to the SBMM load allocation. It may be possible to adjust the allocation among the terrestrial site and the contaminated sediments associated with the SBMM, provided the internal reallocation achieves the same overall reduction in loads from mine-related sources (terrestrial mine site and ongoing contributions from highly contaminated sediments). Any internal adjustment must achieve the sediment compliance goals in the east end of Oaks Arm.

Although USEPA is currently spending public funds to address the releases from the SBMM, the owner of SBMM is the party that is legally responsible for addressing the past, current and future releases from the SBMM and for developing implementation plans, implementing control activities that result in achievement of the load reduction, and performing monitoring to verify the load reduction.

4.5.4.1.3 Tributaries and Surface Water Runoff

Past and current loads of total mercury from the tributaries and direct surface water runoff are also a source of mercury loading to the lake and to the active sediment layer in the lakebed. This section excludes loads from surface water runoff associated with the SBMM because those are addressed separately above. The loads of total mercury from the tributaries and surface water runoff to Clear Lake should be reduced by 20% of existing levels. In an average water year, existing loads are estimated to be 18 kg/year. Loads range from 1 to 60 kg/year, depending upon water flow rates and other factors. The load allocation applies to tributary inputs as a whole, instead of to individual tributaries. Efforts should be focused on identifying and controlling inputs from hot spots. The U.S. Bureau of Land Management, U.S. Forest Service, other land management agencies in the Clear Lake Basin, and Lake County shall submit plans for monitoring and implementation to achieve the necessary load reductions. The Regional Water Board will coordinate with the above named agencies and other interested parties to develop the monitoring and implementation plans. The purpose of the monitoring shall be to refine load estimates and identify potential hot spots of mercury loading from tributaries or direct surface runoff into Clear Lake. Hot spots may include erosion of soils with concentrations of mercury above the average for the rest of the tributary. If significant sources are identified, the Regional Water Board will coordinate with the agencies to develop and implement load reductions. The implementation plans shall include a summation of existing erosion control efforts and a discussion of feasibility and proposed actions to control loads from identified hot spots. The agencies will provide monitoring and implementation plans within five years after the effective date of this amendment and implement load reduction plans within five years thereafter. The goal is to complete the load reductions within ten years of implementation plan approval.

Regional Water Board staff will work with the Native American Tribes in the Clear Lake watershed on mercury reduction programs for the tributaries and surface water runoff. Staff will solicit the Tribe's participation in the development of monitoring and implementation plans.

4.5.4.1.4 Wetlands

The Regional Water Board is concerned about the potential for wetland areas to be significant sources of methylmercury. Loads and fate of methylmercury from wetlands that drain to Clear Lake are not fully understood. The potential for production of methylmercury should be assessed during the planning of any wetlands or floodplain restoration projects within the Clear Lake watershed. The Regional Water Board establishes a goal of no significant increases of methylmercury to Clear Lake resulting from such activities. As factors contributing to mercury methylation are better understood, the possible control of existing methylmercury production within tributary watersheds should be examined.

4.5.4.1.5 Atmospheric Deposition

Atmospheric loads of mercury originating outside of the Clear Lake watershed and depositing locally are minimal. Global and regional atmospheric inputs of mercury are not under the jurisdiction of the Regional Water Board. Loads of mercury from outside of the Clear Lake

watershed and depositing from air onto the lake surface are established at the existing input rate, which is estimated to be 1 to 2 kg/year.

4.5.4.1.6 Public Education

An important component of the Clear Lake mercury strategy is public education. Until the effects of all mercury reduction efforts are reflected in fish tissue levels, the public needs to be continually informed about safe fish consumption levels. The Lake County Public Health Department will provide outreach and education to the community, emphasizing portions of the population that are at risk, such as pregnant women and children. Education efforts may include recommendations to eat smaller fish and species having lower mercury concentrations.

4.5.4.1.7 Monitoring and Review

The monitoring plan for Clear Lake will determine whether mercury loads have been reduced to meet sediment compliance goals and fish tissue objectives. Monitoring will include fish tissue, water and sediment sampling. The Regional Water Board will oversee the preparation of detailed monitoring plans and resources to conduct monitoring of sediment, water and fish to assess progress toward meeting the water quality objectives. Chapter 5, Surveillance and Monitoring, provides details for monitoring in Clear Lake.

The Regional Water Board will review the progress toward meeting the fish tissue objectives for Clear Lake every five years. The review will be timed to coincide with the five-year review to be conducted by USEPA for the Record of Decision for the Sulphur Bank Mercury Mine Superfund Site. The Clear Lake mercury management strategy was developed with existing information. The Regional Water Board recognizes that there are uncertainties with the load estimates and the correlation between reductions in loads of total mercury, methylmercury uptake by biota, and fish tissue concentrations. Regional Water Board staff will consider any new data to refine load estimates and allocations from sources within the Clear Lake watershed. Estimates of existing loads from SBMM or the tributaries will be refined during the review process. If new data indicate that the linkage analysis or load allocations will not result in attainment of the fish tissue objectives, or the fish tissue objectives or load allocations require adjustment, revisions to the Basin Plan will be proposed.

4.5.4.2 Cache Creek Watershed Mercury Program

The Cache Creek watershed methylmercury and total mercury implementation program applies to Cache Creek (from Clear Lake to the Settling Basin outflow and North Fork Cache Creek from Indian Valley Reservoir Dam to the main stem Cache Creek), Bear Creek, Sulphur Creek, and Harley Gulch. This implementation program is intended to reduce loads of methylmercury and total mercury to achieve all applicable water quality standards for mercury and methylmercury, including the site-specific water quality objectives for methylmercury in fish tissue. Guidance for monitoring mercury in fish, water, and sediment is provided in Chapter 5, Surveillance and Monitoring.

Historic mining activities in the Cache Creek watershed have discharged and continue to discharge large volumes of inorganic mercury (termed total mercury) to creeks in the watershed. Much of the mercury discharged from the mines is now distributed in the creek channels and floodplain downstream from the mines. Natural erosion processes can be expected to slowly move the mercury downstream out of the watershed over the next several hundred years. However, current and proposed activities in and around the creek channel can enhance mobilization of this mercury. Activities in upland areas, such as road maintenance and grazing

and timber activities can add to the mercury loads reaching Cache Creek, particularly when the activities take place in areas that have elevated mercury levels.

Total mercury in the creeks is converted to methylmercury by bacteria in the sediment. The concentration of methylmercury in fish tissue is directly related to the concentration of methylmercury in the water. The concentration of methylmercury in the water column is controlled in part by the concentration of total mercury in the sediment and the rate at which the total mercury is converted to methylmercury. The rate at which total mercury is converted to methylmercury is variable from site to site, with some sites (i.e., wetlands and marshes) having greatly enhanced rates of methylation.

Since methylmercury in the water column is directly related to mercury levels in fish, the following methylmercury load allocations are assigned to tributaries and the main stem of Cache Creek.

4.5.4.2.1 Methylmercury Load Allocations

[Tables 4-11](#) and [12](#) provide methylmercury load allocations for Cache Creek, its tributaries, and instream methylmercury production. Allocations are expressed as a percent of existing methylmercury loads. The methylmercury allocations will be achieved by reducing the annual average methylmercury (unfiltered) concentrations to site-specific, aqueous methylmercury goals, which are 0.14 ng/L in Cache Creek, 0.06 ng/L in Bear Creek, and 0.09 ng/L in Harley Gulch. The allocations in [Tables 4-11](#) and [4-12](#) apply to sources of methylmercury entering each tributary or stream segment. In aggregate, the sources to each tributary or stream segment shall have reductions of methylmercury loads as shown below.

Table [4-12](#) provides the load allocation within Bear Creek and its tributaries to attain the allocation for Bear Creek described in [Table 4-11](#). The inactive mines listed in [Table 4-14](#) are assigned a 95% total mercury load reduction. Reductions in mercury loads from mines, erosion, and other sources in the Sulphur Creek watershed are expected to reduce in channel production of methylmercury to meet the Sulphur Creek methylmercury allocation.

To achieve the water quality objectives and the methylmercury allocations listed in [Tables 4-11](#) and [12](#), the following actions are needed: 1) reduce loads of total mercury from inactive mines, 2) where feasible, implement projects to reduce total mercury inputs from existing mercury-containing sediment deposits in creek channels and creek banks downstream from historic mine discharges, 3) reduce erosion of soils with enriched total mercury concentrations, 4) limit activities in the watershed that will increase methylmercury discharges to the creeks and, where feasible, reduce discharges of methylmercury from existing sources, and 5) evaluate other remediation actions that are not directly linked to activities of a discharger. Because methylmercury is a function of total mercury, reductions in total mercury loads are needed to achieve the methylmercury load allocations. Methylmercury allocations will be achieved in part by natural erosion processes that remove mercury that has deposited in creek beds and banks since the start of mining.

[Table 4-13](#) summarizes implementation actions, affected watersheds, and agencies or persons assigned primary responsibility for mercury load reduction projects, and required completion dates for the projects. For purposes of this Basin Plan Implementation Program, the term "project" refers to actions or activities that result in a discharge of mercury to Cache Creek or are conducted within the 10-year floodplain.

TABLE 4-11
CACHE CREEK METHYLMERCURY ALLOCATIONS

Source	Existing Annual Load (g/yr)	Acceptable Annual Load (g/yr)	Allocation (% of existing load)
Cache Creek (Clear Lake to North Fork confluence)	36.8	11	30%
North Fork Cache Creek	12.4	12.4	100%
Harley Gulch	1.0	0.04	4%
Davis Creek	1.3	0.7	50%
Bear Creek @ Highway 20	21.1	3	15%
Within channel production and ungauged tributaries	49.5	32	65%
		7 (a)	10% (a)
<i>Total of loads</i>	122	66	54%
Cache Creek at Yolo (b)	72.5	39	54%
Cache Creek Settling Basin Outflow (c)	87	12	14%

- a. The allocation includes a margin of safety, which is set to 10% of the acceptable loads. In terms of acceptable annual load estimates, the margin of safety is 7 g/yr.
- b. Cache Creek at Yolo is the compliance point for the tributaries and Cache Creek channel for meeting the allocations and aqueous goals. Agricultural water diversions upstream of Yolo remove methylmercury (50 g/year existing load).
- c. The Settling Basin Outflow is the compliance point for methylmercury produced in the Settling Basin.

TABLE 4-12
BEAR CREEK METHYLMERCURY ALLOCATIONS

Source	Existing Annual Load (g/yr)	Acceptable Annual Load (g/yr)	Allocation (% of existing load)
Bear Creek @ Bear Valley Road	1.7	0.9	50%
Sulphur Creek	8	0.8	10%
In channel production and ungauged tributaries	11.4	1	10%
		0.3 (a)	10% (a)
<i>Total of loads</i>	21.1	3	15%
Bear Creek at Hwy 20 (b)	21.1	3	15%

- a. The allocation includes a margin of safety, which is set to 10% of the acceptable loads. In terms of acceptable annual load estimates, the margin of safety is 0.3 g/yr.
- b. Bear Creek at Highway 20 is the compliance point for Bear Creek and its tributaries.

**TABLE 4-13
IMPLEMENTATION SUMMARY**

Implementation Activity	Affected Watersheds	Assigned Responsibility	Action	Completion Date
Inactive Mines	Bear Creek, Harley Gulch, Sulphur Creek	Mine owners and other responsible parties, USBLM	Cleanup mines, sediment, and wetlands	2011
Creek Sediments- Harley Gulch Delta	Harley Gulch	USBLM	Conduct additional studies	2006
			Submit report on engineering options	2008
			Conduct projects, as required	2011
Creek Sediments- Upper Watershed	Bear Creek, Davis Creek, Harley Gulch, Sulphur Creek, and Cache Creek (Harley Gulch to Camp Haswell)	USBLM, SLC, CDFW, Colusa, Lake, and Yolo Counties, private landowners	Conduct additional studies	2007
			Feasibility studies	(Scope and time schedule for plan and reports determined as needed)
			Conduct Projects (as required)	
Erosion Control- Upper Watershed	Sub-watersheds with "enriched" mercury. Includes areas of Bear Creek, Sulphur Creek, and Cache Creek (Harley Gulch to Camp Haswell)	USBLM, SLC, CDFW, Colusa, Lake, and Yolo Counties, private landowners	Conduct additional studies	2006
			Identify activities that increase erosion	2007
			Submit erosion control plans, as required	2009
			Implement erosion control plans, as required	2011
Erosion Control from New Projects, 10-yr Floodplains	Cache Creek (Harley Gulch to Settling Basin), Bear and Sulphur Creeks, Harley Gulch	Yolo County, Reclamation Board, private landowners, US Army Corps of Engineers	Implement management practices and monitoring for erosion control	During and after project construction
New Reservoirs, Ponds, and Wetlands	Cache Creek watershed	Yolo County or project proponents	Submit plans to control methylmercury discharges	Prior to project construction

**TABLE 4-13
IMPLEMENTATION SUMMARY**

Implementation Activity	Affected Watersheds	Assigned Responsibility	Action	Completion Date
Anderson Marsh	Cache Creek at Clear Lake	California Department of Parks and Recreation	Conduct additional studies	2006
			Submit report on management options	2008
			Conduct Project (as required)	2011

4.5.4.2.2 *Inactive Mines*

By 6 February 2009, the Regional Water Board shall adopt cleanup and abatement orders or take other appropriate actions to control discharges from the inactive mines ([Table 4-13](#)) in the Cache Creek watershed. Responsible parties shall develop and submit for Executive Officer approval plans, including a time schedule, to reduce loads of mercury from mining or other anthropogenic activities by 95% of existing loads consistent with State Water Resources Control Board Resolution 92-49. The goal of the cleanup is to restore the mines to pre-mining conditions with respect to the discharge of mercury. Mercury and methylmercury loads produced by interaction of thermal springs with mine wastes from the Turkey Run and Elgin mines are considered to be anthropogenic loading. The responsible parties shall be deemed in compliance with this requirement if cleanup actions and maintenance activities are conducted in accordance with the approved plans. Cleanup actions at the mines shall be completed by 2011.

The wetland immediately downstream from the Abbott and Turkey Run mines in Harley Gulch contains mercury and is a source of methylmercury. After mine cleanup has been initiated, the responsible parties and owners of the wetland shall develop and submit for Executive Officer approval a cleanup and abatement plan to reduce the wetland's methylmercury loads to meet the Harley Gulch aqueous methylmercury allocation. The wetland cleanup and abatement shall be completed by 2011. Cleanup and abatement at the wetland should not be implemented prior to cleanup actions at the upstream mines.

The Sulphur Creek streambed and flood plain directly below the Central, Cherry Hill, Empire, Manzanita, West End and Wide Awake Mines contains mine waste. After mine cleanup has been initiated, the responsible parties and owners of the streambed and floodplain shall develop and submit for Executive Officer approval a cleanup and abatement plan to reduce anthropogenic mercury loading in the creek.

TABLE 4-14
CACHE CREEK WATERSHED INACTIVE MINES (a)

Mine	Average Annual Load Estimate, kg mercury/year (b)
Abbott and Turkey Run Mines	7
Rathburn and Rathburn-Petray Mines	20
Petray North and South Mines	5
Wide Awake Mine	0.8
Central, Cherry Hill, Empire, Manzanita, and West End Mines	5
Elgin Mine	3
Clyde Mine	0.4

a. The mines are grouped by current landowner. Although cleanup requirements apply to each mine, a single owner or responsible party having adjacent mines may apply the 95% reduction to the total discharge from their mines.

b. Estimates of average annual loads are preliminary, based on data collected by the California Geological Survey (Rathburn, Rathburn-Petray, Petray North, and Petray South mines) and Regional Water Board staff (other mines). Load estimates do not include mercury that would be discharged in extreme erosional events. Responsible parties may be required to refine the load estimates.

4.5.4.2.3 Creek Sediment – Upper Watershed

There are areas downstream from mines in Harley Gulch, Bear Creek, Sulphur Creek, Davis Creek and Cache Creek that have significant deposits of mercury-containing sediment that were derived, at least in part, from historic discharges from the mines. Where feasible, sediment discharges from these deposits need to be reduced or eliminated.

The Regional Water Board and the USBLM will conduct additional studies to determine the extent of mercury in sediment at the confluence of Harley Gulch and Cache Creek. The Regional Water Board will require the USBLM to evaluate engineering options to reduce erosion of this material to Cache Creek. If feasible projects are identified, the Regional Water Board will require USBLM to cleanup the sediment.

At other sites, further assessments are needed to determine whether responsible parties should be required to conduct feasibility studies to evaluate methods to control sources of mercury and methylmercury. The Executive Officer will, to the extent appropriate, prioritize the need for feasibility studies and subsequent remediation actions based on mercury concentrations and masses, erosion potential, and accessibility. Staff intends to complete the assessments by 6 February 2009. Where applicable, the Executive Officer will notify responsible parties to submit feasibility studies. Following review of the feasibility studies, the Executive Officer will determine whether cleanup actions will be required. Responsible parties that could be required to conduct feasibility studies include the US Bureau of Land Management (USBLM); State Lands Commission (SLC), California Department of Fish and Wildlife (CDFW); Yolo, Lake, and Colusa Counties, mine owners, and private landowners. Assessments are needed of stream beds and banks in the following areas: Cache Creek from Harley Gulch to Camp Haswell, Harley Gulch, Sulphur Creek, and Bear Creek south of the Bear Valley Road crossing.

4.5.4.2.4 *Erosion Control – Upper Watershed*

Activities in upland parts of the watershed (i.e., outside the active floodplain), such as road construction and maintenance, grazing, timber management and other activities, can result in increased erosion and transport of mercury to the creeks, especially in parts of the watershed where the soils have enriched levels of mercury. Enriched soil and sediment is defined as having an average concentration of mercury of 0.4 mg/kg, dry weight in the silt/clay fraction (less than 63 microns). Provisions described below are applicable in the following areas: the Cache Creek watershed (Harley Gulch to Camp Haswell), Harley Gulch and Sulphur Creek watersheds, and the Bear Creek watershed south of the Bear Valley Road crossing. Some projects subject to this implementation plan may be subject to permits, including general stormwater permits. This implementation plan does not preclude the requirement to obtain any applicable federal, state, or local permit applicable to such projects.

4.5.4.2.4.1 Road Construction and Maintenance

Management practices shall be implemented to control erosion from road construction and maintenance activities in parts of the watershed identified above. All California Department of Transportation (Caltrans) road construction projects or maintenance activities that result in soil disturbance shall comply with the Caltrans statewide Storm Water Management Plan and implement best management practices to control erosion, including pre-project assessments to identify areas with enriched mercury and descriptions of additional management practices that will be implemented in these areas. Water quality and sediment monitoring may be required to ensure compliance with these requirements. For paved roads, entities maintaining or constructing road shall implement the Caltrans or equivalent management practices to comply with these requirements. For unpaved roads, entities maintaining or constructing road shall implement all reasonable management practices to control erosion during construction and maintenance activities. By 6 February 2009, county and agency road departments shall submit information describing the management practices that will be implemented to control erosion.

4.5.4.2.4.2 Other Activities

A goal of the Regional Water Board is to minimize erosion from areas with enriched mercury concentrations. Further studies are needed to identify specific upland sites within the watershed areas described above that have enriched mercury concentrations and to evaluate whether activities at these sites could result in increased erosion (i.e., grazing, timber harvest activities, etc.) or contribute to increases in methylmercury production. Staff will identify areas with enriched mercury concentrations by 6 February 2008. After the studies are complete, the Executive Officer will require affected landowners and/or land managers to 1) submit reports that identify anthropogenic activities on their lands that could result in increased erosion and 2) implement management practices to control erosion. As necessary, erosion control plans will be required no later than 6 February 2011. Entities responsible for controlling erosion include the US Bureau of Land Management (USBLM); State Lands Commission (SLC); California Department of Fish and Wildlife (CDFW); Yolo, Lake, and Colusa Counties; and private landowners.

Landowners implementing new projects or proposing change in land use on land in the enriched areas shall implement practices to control erosion and minimize discharges of mercury and methylmercury. If the dischargers are not implementing management practices to control erosion or methylmercury discharges, the Regional Water Board may consider individual prohibitions of waste discharge. For proposed changes in land use or new projects, landowners

shall submit a plan including erosion estimates from the new project, erosion control practices, and, if a net increase in erosion is expected to occur, a remediation plan.

4.5.4.2.5 Erosion Control in the 10-Year Floodplains

Sediment and soil in the depositional zone of creeks downstream of mines in the Cache Creek watershed contains mercury. A goal of this plan is to minimize erosion of the mercury-containing sediment and soil due to human activities in order to protect beneficial uses in Cache Creek and to reduce loads of mercury moving downstream to the Settling Basin and the Delta. Some projects subject to this implementation plan may be subject to permits, including general stormwater permits. This implementation plan does not preclude the requirement to obtain any applicable federal, state, or local permit applicable to such projects.

The following requirements for erosion control apply to all projects conducted within the 10 year floodplains of Cache Creek (from Harley Gulch to the Settling Basin outflow), Bear Creek (from tributaries draining Petray and Rathburn Mines to Cache Creek), Sulphur Creek, and Harley Gulch.

Project proponents are required to: 1) implement management practices to control erosion and 2) conduct monitoring programs that evaluate compliance with the turbidity objective, and submit monitoring results to the Regional Water Board. The monitoring program must include monitoring during the next wet season in which the project sites are inundated. In general, there must be monitoring for each project. However, in cases where projects are being implemented as part of a detailed resource management plan that includes erosion control practices, monitoring is not required as a condition of this amendment for individual projects. Instead, the project proponent may conduct monitoring at designated sites up and downstream of the entire management plan area.

Upon written request by project proponents, the Executive Officer may waive the turbidity monitoring requirements for a project, or group of projects, if the project proponents submit an alternative method for assessing compliance with the turbidity objective.

Whenever practicable, proponents should maximize removal of mercury enriched sediment from the floodplain. Sediment removed from the channel or the Settling Basin must be placed so that it will not erode into the creek. For projects related to habitat restoration or erosion control consistent with a comprehensive resource management plan, the project proponent may relocate sediment within the channel if the proponent uses the sediment to enhance habitat and provides appropriate erosion controls.

Some projects may not be able to meet the turbidity objectives even when all reasonable management practices will be implemented to control erosion. These projects may still be implemented if project proponents implement actions (offset projects) in some other part of the watershed that would reduce or otherwise prevent discharges of sediment containing mercury in an amount at least equivalent to the incremental increases expected from the original project. Removal of sediment from the Settling Basin would be an acceptable offset project.

All bridge, culvert, or road construction or maintenance activities that may cause erosion within the 10-year flood plains must follow the Caltrans management practices or equivalent to control erosion.

The Executive Officer may waive, consistent with State and federal law, the requirement for erosion control from a project conducted in the 10-year floodplain for habitat conservation or development activities for bank swallows that are proposed under the State's adopted Bank

Swallow Recovery Plan (Department of Fish and Game (later renamed the Department of Fish and Wildlife), 1992).

4.5.4.2.6 *New Reservoirs, Ponds, and Wetlands*

Reservoirs, ponds, impoundments and wetlands generally produce more methylmercury than streams or rivers. Building new impoundments and wetlands that discharge to creeks in the Cache Creek watershed can add to the existing loads of methylmercury in Cache Creek and its tributaries. New impoundments, including reservoirs and ponds, and constructed wetlands shall be constructed and operated in a manner that would preclude an increase in methylmercury concentrations in Cache Creek, Bear Creek, Harley Gulch, or Sulphur Creek. This requirement applies to all new projects in the watershed, including gravel mining pits in lower Cache Creek that are being reclaimed as ponds and wetlands, for which physical construction is started after the approval of this implementation plan. "Preclude an increase in methylmercury concentrations" shall be defined as a measurable increase in aqueous concentration of methylmercury downstream of the discharge relative to upstream of the discharge.

Any entity creating an impoundment or constructed wetland that has the potential through its design to discharge surface water to Cache Creek, Bear Creek, Harley Gulch, or Sulphur Creek (uncontrollable discharge after inundation by winter storm flows is excepted) must submit plans to the Regional Water Board that describe design and management practices that will be implemented to limit the concentration of methylmercury in discharges to the creek.

The Executive Officer will consider granting exceptions to the no net increase requirement in methylmercury concentration if: 1) dischargers provide information that demonstrates that all reasonable management practices to limit discharge concentrations of methylmercury are being implemented and 2) the projects are being developed for the primary purpose of enhancing fish and wildlife beneficial uses. In granting exceptions to the no net increase requirement, the Executive Officer will consider the merits of the project and whether to require the discharger to propose other activities in the watershed that could offset the incremental increases in methylmercury concentration in the creek. The Regional Water Board will periodically review the progress towards achieving the objectives and may consider prohibitions of methylmercury discharge if the plan described above is ineffective.

The Cache Creek Nature Preserve (CCNP), which includes a wetland restored from a gravel excavation, currently minimizes any methylmercury discharges to Cache Creek by holding water within the wetlands. If water management in the CCNP wetlands is changed significantly, the operator must submit plans describing management practices that will be implemented to limit methylmercury discharge to Cache Creek.

4.5.4.2.7 *Anderson Marsh Methylmercury*

The Regional Water Board, in coordination with California Department of Parks and Recreation (DPR), will continue to conduct methylmercury studies in Anderson Marsh. If the Regional Water Board finds that Anderson Marsh is a significant methylmercury source to Cache Creek, the Regional Water Board will require DPR to evaluate potential management practices to reduce methylmercury loads. The Regional Water Board will then consider whether to require DPR to implement a load reduction project.

4.5.4.2.8 *Cache Creek Settling Basin*

Although the Cache Creek settling basin retains about one half of the total mercury attached to sediment that enters the basin, there is a net increase in methylmercury discharged from the

settling basin. Methylmercury loads are expected to decrease as inflow mercury concentrations decline. The Regional Water Board will continue to conduct methylmercury studies in the basin and work with the Reclamation Board and the US Army Corps of Engineers to develop settling basin improvements to retain more sediment and reduce methylmercury loads. The Sacramento-San Joaquin Delta mercury implementation plan will include total mercury load reduction requirements for the settling basin.

4.5.4.2.9 Geothermal and Spring Sources

In general, geothermal springs that discharge mercury and sulfate may not be controllable. However, geothermal discharges adjacent to Sulphur Creek are potential candidates for remediation or mercury offset projects. As needed, the Executive Officer will make a determination of the suitability of geothermal source controls for offset or remediation projects.

Thermal springs used by the Wilbur Hot Springs resort are a source of mercury and methylmercury to Sulphur Creek. Discharges of mercury or methylmercury from springs used or developed by the Wilbur Hot Springs resort shall not exceed current loads.

4.5.4.2.10 Potential Actions

This control plan focuses on reducing mercury discharges from mercury mines, controlling activities that mobilize past discharges from the mines, controlling activities that enhance methylation of mercury, and implementing cleanup and abatement activities at sites where sediment rich in mercury has accumulated. Responsibility for these actions may be assigned to responsible parties. There are a number of other actions that may be considered that would reduce loads of mercury in the creek that are not directly the responsibility of a discharger. The following actions are recommended for further evaluation:

- Construction of a settling basin upstream of Rumsey. The facility could trap mercury enriched sediment, reduce downstream loads and preserve space in the existing settling basin in Yolo Bypass.
- Methylmercury reduction plans for Bear Creek
- Load reductions from Davis Creek

4.5.4.2.11 Mercury Offset Program and Alternative Load Allocations

The Regional Water Board recognizes that cleanup of mines and non-point sources will require substantial financial resources. The Regional Water Board, therefore, will allow entities participating in approved mercury offset programs to conduct offset projects in the Cache Creek watershed. Offset programs shall be focused on projects where funding is not otherwise available. Subject to approval by the Executive Officer, entities participating in an offset program may partner with agencies in mercury control actions. The framework for offset programs will be developed in future Basin Plan amendments.

The methylmercury load allocations in [Tables 4-11](#) and [12](#) are assigned to watersheds. To allow offset program proponents to conduct projects within the watersheds to reduce loads, the Regional Water Board may consider alternative load allocations that will achieve the water quality objectives.

4.5.4.2.12 Public Education

The local county health departments should provide outreach and education regarding the risks of consuming fish containing mercury, emphasizing portions of the population that are at risk, such as pregnant women and children.

4.5.4.2.13 Adaptive Implementation

The Regional Water Board will review the progress toward meeting the water quality objectives and the Basin Plan requirements at least every five years. The Regional Water Board recognizes that it may take hundreds of years to achieve the fish tissue objectives. The Regional Water Board considers entities to be in compliance with this mercury reduction plan if they comply with the above requirements for mercury, methylmercury, and erosion controls. The Regional Water Board recognizes that there are uncertainties with the load estimates and the correlation between reductions in loads of total mercury, methylmercury uptake by biota, and fish tissue concentrations. Using an adaptive management approach, however, the Regional Water Board will evaluate new data and scientific information to determine the most effective control program and allocations to reduce methylmercury and total mercury sources in the watershed.

4.5.4.2.14 Monitoring and Review

The monitoring guidance for Cache Creek is described in Chapter 5, Surveillance and Monitoring. Regional Water Board staff will oversee the preparation of detailed monitoring plans and resources to conduct monitoring of sediment, water, and fish to assess progress toward meeting the water quality objectives. Regional Water Board staff will take the lead in determining compliance with fish tissue objectives for Cache Creek. Monitoring for cleanup of mines or compliance with the erosion control requirements is the responsibility of the entity performing the cleanup or erosion control.

4.5.4.3 Delta Mercury Control Program

The Delta Mercury Control Program applies specifically to the Delta and Yolo Bypass waterways listed in Appendix 43.

This amendment was adopted by the Regional Water Quality Control Board on 22 April 2010, and approved by the U.S. Environmental Protection Agency on 20 October 2011. The Effective Date of the Delta Mercury Control Program shall be 20 October 2011, the date of U.S. EPA approval.

4.5.4.3.1 Program Overview

The Delta Mercury Control Program is designed to protect people eating one meal/week (32 g/day) of trophic levels 3 and 4 Delta fish, plus some non-Delta (commercial market) fish. The Regional Water Board recognizes that some consumers eat four to five meals per week (128-160 g/day) of a variety of Delta fish species. The fish tissue objectives will be re-evaluated during the Phase 1 Delta Mercury Control Program Review and later program reviews to determine whether objectives protective of a higher consumption rate can be attained as methylmercury reduction actions are developed and implemented.

Additional information about methylmercury source control methods must be developed to determine how and if Dischargers can attain load and waste load allocations set by the Board. Information is also needed about the methylmercury control methods' potential benefits and adverse impacts to humans, wildlife, and the environment. Therefore, the Delta Mercury Control Program will be implemented through a phased, adaptive management approach.

Phase 1 spans from 20 October 2011 through the Phase I Delta Mercury Control Program Review, expected to be by 20 October 2020. Phase 1 emphasizes studies and pilot projects to

develop and evaluate management practices to control methylmercury. Phase 1 includes provisions for: implementing pollution minimization programs and interim mass limits for inorganic (total) mercury point sources in the Delta and Yolo Bypass; controlling sediment-bound mercury in the Delta and Yolo Bypass that may become methylated in agricultural lands, wetland, and open-water habitats; and reducing total mercury loading to San Francisco Bay, as required by the Water Quality Control Plan for the San Francisco Bay Basin.

Phase 1 also includes: the development of upstream mercury control programs for major tributaries; the development and implementation of a mercury exposure reduction program to protect humans; and the development of a mercury offset program.

At the end of Phase 1, the Regional Water Board shall conduct a Phase 1 Delta Mercury Control Program Review that considers: modification of methylmercury goals, objectives, allocations and/or the Final Compliance Date; implementation of management practices and schedules for methylmercury controls; and adoption of a mercury offset program for dischargers who cannot meet their load and waste load allocations after implementing all reasonable load reduction strategies. The review also shall consider other potential public and environmental benefits and negative impacts (e.g., habitat restoration, flood protection, water supply, fish consumption) of attaining the allocations. The fish tissue objectives, the linkage analysis between objectives and sources, and the attainability of the allocations will be re-evaluated based on the findings of Phase 1 control studies and other information. The linkage analysis, fish tissue objectives, allocations, and time schedules shall be adjusted at the end of Phase 1, or subsequent program reviews, if appropriate.

Phase 2 begins after the Phase 1 Delta Mercury Control Program Review or 20 October 2022, whichever occurs first, and ends in 2030. During Phase 2, dischargers shall implement methylmercury control programs and continue inorganic (total) mercury reduction programs. Compliance monitoring and implementation of upstream control programs also shall occur in Phase 2.

4.5.4.3.2 Load and Waste Load Allocations

Final methylmercury waste load allocations for point sources and load allocations for non-point sources are listed in [Tables 4-15](#) through [4-18](#). For each subarea listed in [Table 4-15](#), the sum of allocations for agricultural drainage, atmospheric wet deposition, open water, urban (nonpoint source), and wetlands and the individual allocations for tributary inputs ([Table 4-18](#)), NPDES facilities and NPDES facilities future growth ([Table 4-16](#)), and NPDES MS4 ([Table 4-17](#)) within that subarea equals that subarea's assimilative capacity. New or expanded methylmercury discharges that begin after 20 October 2011 may necessitate adjustments to the allocations.

Load allocations are specific to Delta subareas, which are shown on Figure A43. The load allocations for each Delta subarea apply to the sum of annual methylmercury loads produced by different types of nonpoint sources: agricultural lands, wetlands, and open-water habitat in each subarea, as well as atmospheric wet deposition to each subarea ([Table 4-15](#)), and runoff from urban areas outside of Municipal Separate Storm Sewer System (MS4) service areas. The subarea allocations apply to both existing and future discharges.

Waste load allocations apply to point sources, which include individual NPDES permitted facility discharges and runoff from urban areas within MS4 service areas within the Delta and Yolo Bypass ([Tables 4-16](#) and [4-17](#), respectively).

Methylmercury allocations are assigned to tributary inputs to the Delta and Yolo Bypass ([Table 4-18](#)). Future upstream control programs are planned for tributaries to the Delta through

which management practices will be implemented to meet load allocations for tributary inputs assigned by the Delta Mercury Control Program.

Load allocations for the tributary inputs, urban areas outside of MS4 service areas, open-water habitat, and atmospheric deposition, and waste load allocations for the MS4s, are based on water years 2000 through 2003, a relatively dry period. Annual loads are expected to fluctuate with rainfall volume and other factors. As a result, attainment of these allocations shall be assessed as a five-year average annual load. Allocations for these sources will be re-evaluated during review of the Phase 1 Delta Mercury Control Program as wet year data become available.

4.5.4.3.3 Margin of Safety

The Delta Mercury Control program includes an explicit margin of safety of 10%.

4.5.4.3.4 Final Compliance Date

Methylmercury load and waste load allocations for dischargers in the Delta and Yolo Bypass shall be met as soon as possible, but no later than 2030, unless the Regional Water Board modifies the implementation schedule and Final Compliance Date.

During Phase 1, all dischargers shall implement reasonable, feasible controls for inorganic (total) mercury.

All dischargers should implement methylmercury management practices identified during Phase 1 that are reasonable and feasible. However, implementation of methylmercury management practices identified in Phase 1 is not required for the purposes of achieving methylmercury load allocations for nonpoint sources until the beginning of Phase 2.

The Regional Water Board will, as necessary, include schedules of compliance in NPDES permits for compliance with water quality-based effluent limits based on the waste load allocations. The compliance schedules must be consistent with the requirements of federal laws and regulations, including, USEPA regulations 40 CFR 122.47, State laws and regulations, including State Water Board Policy for Compliance Schedules in National Pollutant Discharge Elimination System Permits, and the Final Compliance Date. The Regional Board will review the feasibility of meeting wasteload allocations based on reliable data and information regarding variability in methylmercury concentrations and treatment efficiencies and time needed to comply with the wasteload allocations. The Phase 1 Control Studies are designed to provide this information. As needed, the Regional Board shall incorporate the Phase 1 Control Studies into compliance schedules. When Phase 1 studies are complete, the Regional Board will review the need for additional time during Phase 2 for NPDES permittees to comply with the final wasteload allocations.

4.5.4.3.5 Implementation Program

4.5.4.3.5.1 Point Sources

The regulatory mechanism to implement the Delta Mercury Control Program for point sources shall be through NPDES permits.

4.5.4.3.5.1.1 Requirements for NPDES Permitted Facilities

By 20 April 2012, all facilities listed in [Table 4-16](#) shall submit individual pollutant minimization program workplans to the Regional Water Board. The dischargers shall implement their respective pollutant minimization programs within 30 days after receipt of written Executive Officer approval of the workplans. Until the NPDES permitted facility achieves compliance with its waste load allocation, the discharger shall submit annual progress reports on pollution minimization activities implemented and evaluation of their effectiveness, including a summary of mercury and methylmercury monitoring results.

During Phase 1, all facilities listed in [Table 4-16](#) shall limit their discharges of inorganic (total) mercury to facility performance-based levels. The interim inorganic (total) mercury effluent mass limit is to be derived using current, representative data and shall not exceed the 99.9th percentile of 12-month running effluent inorganic (total) mercury loads (lbs/year). For intermittent dischargers, the interim inorganic (total) mercury effluent mass limit shall consider site-specific discharge conditions. The limit shall be assigned in permits and reported as an annual load based on a calendar year. At the end of Phase 1, the interim inorganic (total) mercury mass limit will be re-evaluated and modified as appropriate.

NPDES permitted facilities that begin discharging to the Delta or Yolo Bypass during Phase 1 shall comply with the above requirements.

4.5.4.3.5.1.2 Requirements for NPDES Permitted Urban Runoff Discharges

MS4 dischargers listed in [Table 4-17](#) shall implement best management practices (BMPs) to control erosion and sediment discharges consistent with their existing permits and orders with the goal of reducing mercury discharges.

The Sacramento MS4 (CAS082597), Contra Costa County MS4 (CAS083313), and Stockton MS4 (CAS083470) permittees shall implement pollution prevention measures and BMPs to minimize total mercury discharges. This requirement shall be implemented through mercury reduction strategies required by their existing permits and orders. Annually, the dischargers shall report on the results of monitoring and a description of implemented pollution prevention measures and their effectiveness.

The Sacramento MS4 (CAS082597), Contra Costa County MS4 (CAS083313), and Stockton MS4 (CAS083470) shall continue to conduct mercury control studies to monitor and evaluate the effectiveness of existing BMPs per existing requirements in permits and orders, and to develop and evaluate additional BMPs as needed to reduce their mercury and methylmercury discharges into the Delta and Yolo Bypass.

4.5.4.3.5.2 Nonpoint Sources

Nonpoint sources shall be regulated through the authority contained in State and federal laws and regulations, including State Water Board's Nonpoint Source Implementation and Enforcement Policy.

[Table 4-15](#) contains methylmercury load allocations for non-point sources in the Delta and Yolo Bypass waterways listed in Appendix 43.

During Phase 1, all nonpoint sources in the Delta and Yolo Bypass shall implement reasonable, feasible actions to reduce sediment in runoff with the goal of reducing inorganic mercury loading to the Yolo Bypass and Delta, in compliance with existing Basin Plan objectives and requirements, and Irrigated Lands Regulatory Program requirements.

Attainment of methylmercury load allocations at the end of 2030 will be determined by comparing monitoring data and documentation of methylmercury management practice implementation for each subarea with loads specified in [Table 4-15](#) and [Table 4-18](#).

For subareas not in compliance with allocations by 2030, the Regional Water Board may develop load allocations for individual sources and require individual monitoring and waste discharge requirements.

In subareas needing reductions in methylmercury, proponents of new wetland and wetland restoration projects scheduled for construction after 20 October 2011 shall (a) participate in Control Studies as described below, or shall implement site-specific study plans, that evaluate practices to minimize methylmercury discharges, and (b) implement methylmercury controls as feasible. New wetland projects may include pilot projects and associated monitoring to evaluate management practices that minimize methylmercury discharges.

4.5.4.3.5.3 Phase 1 Control Studies

Point and nonpoint source dischargers, working with other stakeholders, shall conduct methylmercury control studies (Control Studies) to evaluate existing control methods and, as needed, develop additional control methods that could be implemented to achieve their methylmercury load and waste load allocations. The Regional Water Board will use the Phase 1 Control Studies' results and other information to consider amendments to the Delta Mercury Control Program during the Phase 1 Delta Mercury Control Program Review. A Technical Advisory Committee, described below, will review the Control Studies' designs and results.

4.5.4.3.5.3.1 *Study Participants*

Control Studies can be developed through a stakeholder group approach or other collaborative mechanism, or by individual dischargers. Individual dischargers are not required to do individual studies if the individual dischargers join a collaborative study group(s).

Control Studies are required for:

- (1) Irrigated agricultural lands that discharge to the Yolo Bypass and Delta subareas that require methylmercury source reductions.
- (2) Managed wetlands and wetland restoration projects that discharge to the Yolo Bypass and Delta subareas that require methylmercury source reductions.
- (3) Existing NPDES permitted facilities in the Delta and the Yolo Bypass (listed in [Table 4-16](#)).
- (4) Sacramento Area MS4, Stockton MS4, and Contra Costa County MS4 service areas within and upstream of the legal Delta boundary.
- (5) State and Federal agencies whose activities affect the transport of mercury and the production and transport of methylmercury through the Yolo Bypass and Delta, or which manage open water areas in the Yolo Bypass and Delta, including but not limited to Department of Water Resources, State Lands Commission, Central Valley Flood Protection Board, U.S. Army Corps of Engineers, and U.S. Bureau of Reclamation. If appropriate during Phase 1, the Executive Officer will require other water management agencies whose activities affect methylmercury levels in the Delta and Yolo Bypass to participate in the Control Studies.
- (6) Other significant sources of methylmercury not listed above, as identified and deemed appropriate by the Executive Officer.

Dischargers in the Central Valley that are not subject to the Delta Mercury Control Program but may be subject to future mercury control programs in upstream tributary watersheds are

encouraged to participate in the coordinated Delta Control Studies. Dischargers in and upstream of the Delta who participate in the Control Studies will be exempt from conducting equivalent Control Studies required by future upstream mercury control programs.

4.5.4.3.5.3.2 Study Objectives

The Control Studies shall evaluate existing control methods and, as needed, additional control methods that could be implemented to achieve methylmercury load and waste load allocations. The Control Studies shall evaluate the feasibility of reducing sources more than the minimum amount needed to achieve allocations.

Phase 1 studies also may include an evaluation of innovative actions, watershed approaches, offsets projects, and other short and long-term actions that result in reducing inorganic (total) mercury and methylmercury to address the accumulation of methylmercury in fish tissue and to reduce methylmercury exposure.

Dischargers may evaluate the effectiveness of using inorganic (total) mercury controls to control methylmercury discharges.

Dischargers may conduct characterization studies to inform and prioritize the Control Studies. Characterization studies may include, but not be limited to, evaluations of methylmercury and total mercury concentrations and loads in source waters, receiving waters, and discharges, to determine which discharges act as net sources of methylmercury, and which land uses result in the greatest net methylmercury production and loss.

Final reports for Control Studies shall include a description of methylmercury and/or inorganic (total) mercury management practices identified in Phase 1; an evaluation of the effectiveness, and costs, potential environmental effects, and overall feasibility of the control actions. Final reports shall also include proposed implementation plans and schedules to comply with methylmercury allocations as soon as possible.

If the Control Study results indicate that achieving a given methylmercury allocation is infeasible, then the discharger, or an entity representing a discharger, shall provide detailed information on why full compliance is not achievable, what methylmercury load reduction is achievable, and an implementation plan and schedule to achieve partial compliance.

4.5.4.3.5.3.3 Control Study Workplans

Control Studies shall be implemented through Control Study Workplan(s). The Control Study Workplan(s) shall provide detailed descriptions of how methylmercury control methods will be identified, developed, and monitored, and how effectiveness, costs, potential environmental effects, and overall feasibility will be evaluated for the control methods.

The Control Study Workplan(s) shall include details for organizing, planning, developing, prioritizing, and implementing the Control Studies.

The Control Studies will be governed using an Adaptive Management approach.

4.5.4.3.5.3.4 Technical Advisory Committee and Adaptive Management Approach

The Regional Water Board commits to supporting an Adaptive Management approach. The adaptive management approach includes the formation of a Stakeholder Group(s) and a Technical Advisory Committee (TAC). Regional Water Board staff, working with the TAC and

Stakeholder Group(s), will provide a Control Study Guidance Document for stakeholders to reference.

The TAC shall be comprised of independent experts who would convene as needed to provide scientific and technical peer review of the Control Study Workplan(s) and results, advise the Board on scientific and technical issues, and provide recommendations for additional studies and implementation alternatives developed by the dischargers. The Board shall form and manage the TAC with recommendations from the dischargers and other stakeholders, including tribes and community organizations.

Board staff shall work with the TAC and Stakeholder Group(s) to review the Control Study Workplan(s) and results. As new information becomes available from the Control Studies or outside studies that result in redirection and/or prioritization of existing studies, dischargers may amend the Control Study Workplan(s) with Executive Officer approval.

4.5.4.3.5.3.5 *Mercury Control Studies Schedule*

- (1) By 20 April 2012, entities required to conduct Control Studies shall submit for Executive Officer approval either: (1) a report(s) describing how dischargers and stakeholders plan to organize to develop a coordinated, comprehensive Control Study Workplan(s), or (2) a report describing how individual dischargers will develop individual Control Study Workplans. For dischargers conducting coordinated studies, the report shall include a list of participating dischargers, stakeholders, tribes, and community groups. Dischargers shall be considered in compliance with this reporting requirement upon written commitment to either be part of a group developing a Control Study Workplan or develop an individual Control Study Workplan.
- (2) Control Study Workplans shall be submitted to the Regional Water Board by 20 July 2012. With Executive Officer approval, an additional nine months may be allowed for Workplans being developed by a collaborative stakeholder approach. The Control Study Workplan(s) shall contain a detailed plan for the Control Studies and the work to be accomplished during Phase 1. Regional Water Board staff and the TAC will review the Workplans and provide recommendations for revising Workplans if necessary.

Within four months of submittal, the Executive Officer must determine if the Workplans are acceptable. After four months, Workplans are deemed approved and ready to implement if no written approval is provided by the Executive Officer, unless the Executive Officer provides written notification to extend the approval process.

Dischargers shall be considered in compliance with this reporting requirement upon timely submittal of workplans and revisions.

- (3) By 20 October 2015, entities responsible for Control Studies shall submit report(s) to the Regional Water Board documenting progress towards complying with the Control Study Workplan(s). The report shall include amended workplans for any additional studies needed to address methylmercury reductions. The TAC will review the progress reports and may recommend what additional or revised studies should be undertaken to complete the objectives of the Control Studies. Staff will review the progress reports and recommendations of the TAC and provide a progress report to the Regional Water Board.
- (4) By 20 October 2018, entities responsible for Control Studies shall complete the studies and submit to the Regional Water Board Control Studies final reports that present the

results and descriptions of methylmercury control options, their preferred methylmercury controls, and proposed methylmercury management plan(s) (including implementation schedules), for achieving methylmercury allocations. In addition, final report(s) shall propose points of compliance for non-point sources.

If the Executive Officer determines that dischargers are making significant progress towards developing, implementing and/or completing the Phase 1 Control Studies but that more time is needed to finish the studies, the Executive Officer may consider extending a study's deadlines.

The Executive Officer may, after public notice, extend time schedules up to two years if the dischargers demonstrate reasonable attempts to secure funding for the Phase 1 studies but experience severe budget shortfalls.

Annually, staff shall publicly report to the Regional Water Board progress of upstream mercury program development, discharger and stakeholder coordination, Control Study Workplan status, implementation of Control Studies, actions implemented or proposed to meet load and waste load allocations, and the status of the formation and activities of the TAC.

By 20 October 2015, the Executive Officer shall provide a comprehensive report to the Regional Water Board on Phase 1 progress, including progress of upstream mercury control program development, Control Studies, actions implemented or proposed to meet Delta Mercury Control Program load and waste load allocations, and the status and progress of the TAC.

If dischargers do not comply with Control Study implementation schedules, the Executive Officer shall consider issuing individual waste discharge requirements or ordering the production of technical reports and/or management plans.

4.5.4.3.5.3.6 Phase 1 Delta Mercury Control Program Review

By 20 October 2020, at a public hearing, and after a scientific peer review and public review process, the Regional Water Board shall review the Delta Mercury Control Program and may consider modification of objectives, allocations, implementation provisions and schedules, and the Final Compliance Date.

If the Executive Officer allows an extension for the Control Studies' schedule, then the Delta Mercury Control Program Review may be delayed up to two years. If the Delta Mercury Control Program Review is delayed more than one year, the Regional Water Board should consider extending the schedule for Phase 2 implementation of methylmercury controls, and the Final Compliance Date.

The Regional Water Board shall assess: (a) the effectiveness, costs, potential environmental effects, and technical and economic feasibility of potential methylmercury control methods; (b) whether implementation of some control methods would have negative impacts on other project or activity benefits; (c) methods that can be employed to minimize or avoid potentially significant negative impacts to project or activity benefits that may result from control methods; (d) implementation plans and schedules proposed by the dischargers; and (e) whether methylmercury allocations can be attained.

The Regional Water Board shall use any applicable new information and results of the Control Studies to adjust the relevant allocations and implementation requirements as appropriate. Interim limits established during Phase 1 and allocations will not be reduced as a result of early actions that result in reduced inorganic (total) mercury and/or methylmercury in discharges.

As part of the Phase 1 Delta Mercury Control Program Review and subsequent program reviews, the Regional Water Board may consider adjusting the allocations to allow methylmercury discharges from existing and new wetland restoration and other aquatic habitat enhancement projects if dischargers provide information that demonstrates that 1) all reasonable management practices to limit methylmercury discharges are being implemented and 2) implementing additional methylmercury management practices would negatively impact fish and wildlife habitat or other project benefits. The Regional Water Board will consider the merits of the project(s) and whether to require the discharger(s) to propose other activities in the watershed that could offset the methylmercury. The Regional Water Board will periodically review the progress towards achieving the allocations and may consider additional conditions if the plan described above is ineffective.

The Regional Water Board shall conduct the Phase 1 Delta Mercury Program Review based on information received in Phase 1. If the Regional Water Board does not receive timely information to review and update the Delta Mercury Control Program, then allocations shall not be raised but may be lowered and the 2030 Final Compliance Date shall not be changed for those individual dischargers who did not complete the Phase 1 requirements.

The Regional Water Board shall require implementation of appropriate management practices. The methylmercury management plan(s) developed in Phase 1 shall be initiated as soon as possible, but no later than one (1) year after Phase 2 begins.

The Regional Water Board shall review this control program two years prior to the end of Phase 2, and at intervals no more than 10 years thereafter.

4.5.4.3.5.4 Compliance Monitoring

Within two years after the start of Phase 2, entities responsible for meeting load and waste load allocations shall monitor methylmercury loads and concentrations and submit annual reports to the Regional Water Board. The points of compliance for waste load allocations for NPDES facilities shall be the effluent monitoring points described in individual NPDES permits. The points of compliance for MS4s required to conduct methylmercury monitoring are those locations described in the individual MS4 NPDES permits or otherwise determined to be representative of the MS4 service areas and approved by the Executive Officer on an MS4-specific basis. The points of compliance and monitoring plans for non-point sources shall be determined during the Control Studies. Compliance with the load allocations for nonpoint sources and waste load allocations for MS4s may be documented by monitoring methylmercury loads at the compliance points or by quantifying the annual average methylmercury load reduced by implementing pollution prevention activities and source and treatment controls.

Entities will be allowed to comply with their mercury receiving water monitoring requirements by participating in a regional monitoring program, when such a program is implemented.

Chapter 5, Surveillance and Monitoring, contains additional monitoring guidance.

4.5.4.3.5.5 Requirements for State and Federal Agencies

Open water allocations are assigned jointly to the State Lands Commission, the Department of Water Resources, and the Central Valley Flood Protection Board as applicable. Other agencies that are identified in Phase 1 that implement actions and activities that have the potential to contribute to methylmercury production and loss in open water will be required to take part in the studies. In the Phase 1 review, the Regional Water Board will modify, as appropriate, the list of entities that are responsible for meeting the open water allocations. Open water allocations

apply to the methylmercury load that fluxes to the water column from sediments in open-water habitats within channels and floodplains in the Delta and Yolo Bypass.

The State Lands Commission, Central Valley Flood Protection Board, Department of Water Resources, and other identified agencies shall conduct Control Studies and evaluate options to reduce methylmercury in open waters under jurisdiction of the State Lands Commission and floodplain areas inundated by flood flows. These agencies shall evaluate their activities to determine whether operational changes or other practices or strategies could be implemented to reduce ambient methylmercury concentrations in Delta open water areas and floodplain areas inundated by managed floodplain flows. Evaluations shall include inorganic mercury reduction projects. By 20 April 2012, these agencies shall demonstrate how the agencies have secured adequate resources to fund the Control Studies. Regional Water Board staff will work with the agencies to develop the Control Studies and evaluate potential mercury and methylmercury reduction actions.

Activities including water management and impoundment in the Delta and Yolo Bypass, maintenance of and changes to salinity objectives, dredging and dredge materials disposal and reuse, and management of flood conveyance flows are subject to the open water methylmercury allocations. Agencies responsible for these activities in the Delta and Yolo Bypass include, but are not limited to, Department of Water Resources, State Lands Commission, Central Valley Flood Protection Board, U.S. Bureau of Reclamation, U.S. Army Corps of Engineers (USACE), and the State Water Resources Control Board. Control Studies shall be completed for the activities that have the potential to increase ambient methylmercury levels. These agencies may conduct their own coordinated Control Studies or may work with the other stakeholders in comprehensive, coordinated Control Studies.

The agencies should coordinate with wetland and agricultural landowners during Phase 1 to characterize existing methylmercury discharges to open waters from lands immersed by managed flood flows and develop methylmercury control measures.

New wetland, floodplain, and other aquatic habitat restoration and enhancement projects, including but not limited to projects developed, planned, funded, or approved by individuals, private businesses, non-profit organizations, and local, State, and federal agencies such as USACE, U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration Fisheries, U.S. Environmental Protection Agency, U.S. Bureau of Reclamation, State Water Resources Control Board, California Department of Water Resources, and California Department of Fish and Wildlife, shall comply with all applicable requirements of this program, including conducting or participating in Control Studies and complying with allocations. To the extent allowable by their regulatory authority, Federal, State, and local agencies that fund, approve, or implement such new projects shall direct project applicants/grantees/loanees to apply to or consult with the Regional Water Board to ensure full compliance with the water quality requirements herein.

4.5.4.3.5.6 Dredging and Dredge Material Reuse

Dredging activities and activities that reuse dredge material in the Delta should minimize increases in methyl and total mercury discharges to Delta waterways (Appendix 43). The following requirements apply to dredging and excavating projects in the Delta and Yolo Bypass where a Clean Water Act 401 Water Quality Certification or other waste discharge requirements are required. The Clean Water Act 401 Water Quality Certifications shall include the following conditions:

- (1) Employ management practices during and after dredging activities to minimize sediment releases into the water column.
- (2) Ensure that under normal operational circumstances, including during wet weather, dredged and excavated material reused at upland sites, including the tops and dry-side of levees, is protected from erosion into open waters.

In addition to the above requirements, the following requirements apply to the California Department of Water Resources, USACE, the Port of Sacramento, the Port of Stockton, and other State and federal agencies conducting dredging and excavating projects in the Delta and Yolo Bypass:

- (1) Characterize the total mercury mass and concentration of material removed from Delta waterways (Appendix 43) by dredging activities.
- (2) Conduct monitoring and studies to evaluate management practices to minimize methylmercury discharges from dredge return flows and dredge material reuse sites. Agencies shall:
 - By 20 October 2013, project proponents shall submit a study workplan(s) to evaluate methylmercury and mercury discharges from dredging and dredge material reuse, and to develop and evaluate management practices to minimize increases in methyl and total mercury discharges. The proponents may submit a comprehensive study workplan rather than conduct studies for individual projects. The comprehensive workplan may include exemptions for small projects. Upon Executive Officer approval, the plan shall be implemented.
 - By 20 October 2018, final reports that present the results and descriptions of mercury and methylmercury control management practices shall be submitted to the Regional Water Board.

Studies should be designed to achieve the following aims for all dredging and dredge material reuse projects. When dredge material disposal sites are utilized to settle out solids and return waters are discharged into the adjacent surface water, methylmercury concentrations in return flows should be equal to or less than concentrations in the receiving water. When dredge material is reused at aquatic locations, such as wetland and riparian habitat restoration sites, the reuse should not add mercury-enriched sediment to the site or result in a net increase of methylmercury discharges from the reuse site.

The results of the management practices studies should be applied to future projects.

4.5.4.3.5.7 Cache Creek Settling Basin Improvement Plan and Schedule

Department of Water Resources, Central Valley Flood Protection Board, and USACE, in conjunction with any landowners and other interested stakeholders, shall implement a plan for management of mercury contaminated sediment that has entered and continues to enter the Cache Creek Settling Basin (Basin) from the upstream Cache Creek watershed. The agencies shall:

- (1) By 20 October 2012, the agencies shall take all necessary actions to initiate the process for Congressional authorization to modify the Basin, or other actions as appropriate, including coordinating with the USACE.

- (2) By 20 October 2013, the agencies shall develop a strategy to reduce total mercury from the Basin for the next 20 years. The strategy shall include a description of, and schedule for, potential studies and control alternatives, and an evaluation of funding options. The agencies shall work with the landowners within the Basin and local communities affected by Basin improvements.
- (3) By 20 October 2015, the agencies shall submit a report describing the long term environmental benefits and costs of sustaining the Basin's mercury trapping abilities indefinitely.
- (4) By 20 October 2015, the agencies shall submit a report that evaluates the trapping efficiency of the Cache Creek Settling Basin and proposes, evaluates, and recommends potentially feasible alternative(s) for mercury reduction from the Basin. The report shall evaluate the feasibility of decreasing mercury loads from the basin, up to and including a 50% reduction from existing loads.
- (5) By 20 October 2017, the agencies shall submit a detailed plan for improvements to the Basin to decrease mercury loads from the Basin.

The agencies shall submit the strategy and planning documents described above to the Regional Water Board for approval by the Executive Officer. During Phase 1, the agencies should consider implementing actions to reduce mercury loads from the Basin. Beginning in Phase 2, the agencies shall implement a mercury reduction plan.

4.5.4.3.5.8 Tributary Watersheds

[Table 4-18](#) identifies methylmercury allocations for tributary inputs to the Delta and Yolo Bypass.

The sum total of 20-year average total mercury loads from the tributary watersheds identified in [Table 4-18](#) needs to be reduced by 110 kg/yr. Initial reduction efforts should focus on watersheds that contribute the most mercury-contaminated sediment to the Delta and Yolo Bypass, such as the Cache Creek, American River, Putah Creek, Cosumnes River, and Feather River watersheds.

Future mercury control programs will address the tributary watershed methylmercury allocations and total mercury load reductions assigned to tributary inputs to the Delta and Yolo Bypass. Additional methylmercury and total mercury load reductions may be required within those watersheds to address any mercury impairment within those watersheds.

Mercury control programs will be developed for tributary inputs to the Delta by the following dates:

- 2012: American River;
- 2016: Feather, Sacramento, San Joaquin, and Mokelumne Rivers, and Marsh and Putah Creeks; and
- 2017: Cosumnes River and Morrison Creek.

4.5.4.3.5.9 Mercury Offsets

The intent of an offset program is to optimize limited resources to maximize environmental benefits. The overall objectives for an offset program are to (1) provide more flexibility than the current regulatory system provides to improve the environment while meeting regulatory

requirements (i.e., load and wasteload allocations) at a lower overall cost and (2) promote watershed-based initiatives that encourage earlier and larger load reductions to the Delta than would otherwise occur.

On or before 20 October 2020, the Regional Water Board will consider adoption of a mercury (inorganic and/or methyl) offsets program. During Phase 1, stakeholders may propose pilot offset projects for public review and Regional Water Board approval. The offsets program and any Phase 1 pilot offset projects shall be based on the following key principles:

- Offsets shall be consistent with existing USEPA and State Board policies and with the assumptions and requirements upon which this and other mercury control programs are established.
- Offsets should not include requirements that would leverage existing discharges as a means of forcing dischargers to bear more than their fair share of responsibility for causing or contributing to any violation of water quality standards. In this context “fair share” refers to the dischargers’ proportional contribution of methylmercury load.
- Offset credits should only be available to fulfill a discharger’s responsibility to meet its (waste) load allocation after reasonable load reduction and pollution prevention strategies have been implemented.
- Offsets should not be allowed in cases where local human or wildlife communities bear a disparate or disproportionate pollution burden as a result of the offset.
- Offset credits should be available upon generation and last long enough (i.e., not expire quickly) to encourage feasible projects.
- Creditable load reductions achieved should be real, quantifiable, verifiable, and enforceable by the Regional Water Board.

Alternatives to direct load credits may be developed.

4.5.4.3.5.10 Exposure Reduction Program

While methylmercury and mercury source reductions are occurring, the Regional Water Board recognizes that activities should be undertaken to protect those people who eat Delta fish by reducing their methylmercury exposure and its potential health risks. The Exposure Reduction Program (ERP) is not intended to replace timely reduction of mercury and methylmercury loads to Delta waters.

The Regional Water Board will investigate ways, consistent with its regulatory authority, to address public health impacts of mercury in Delta fish, including activities that reduce actual and potential exposure of and mitigate health impacts to those people and communities most likely to be affected by mercury in Delta caught fish, such as subsistence fishers and their families (State Water Board Resolution No. 2005-0060).

By 20 October 2012, Regional Water Board staff shall work with dischargers (either directly or through their representatives), State and local public health agencies (including California Department of Public Health, California Office of Health Hazard Assessment, and county public health and/or environmental health departments), and other stakeholders, including community-based organizations, tribes, and Delta fish consumers, to complete an Exposure Reduction Strategy. The purposes of the Strategy will be to recommend to the Executive Officer how dischargers will be responsible for participating in an ERP, to set performance measures, and to propose a collaborative process for developing, funding and implementing the program. The Strategy shall take into account the proportional share of methylmercury contributed by individual dischargers. If dischargers (either directly or through their representatives) do not participate in the collaborative effort to develop the ERP, the Regional Water Board will evaluate

and implement strategies, consistent with the Regional Water Board's regulatory authority, to assure participation from all dischargers or their representatives.

The objective of the Exposure Reduction Program is to reduce mercury exposure of Delta fish consumers most likely affected by mercury.

The Exposure Reduction Program must include elements directed toward:

- Developing and implementing community-driven activities to reduce mercury exposure;
- Raising awareness of fish contamination issues among people and communities most likely affected by mercury in Delta-caught fish such as subsistence fishers and their families;
- Integrating community-based organizations that serve Delta fish consumers, tribes, and public health agencies in the design and implementation of an exposure reduction program;
- Identifying resources, as needed, for community-based organizations and tribes to participate in the Program;
- Utilizing and expanding upon existing programs and materials or activities in place to reduce mercury, and as needed, create new materials or activities; and
- Developing measures for program effectiveness.

The dischargers, either individually or collectively, or based on the Exposure Reduction Strategy, shall submit an exposure reduction workplan for Executive Officer approval by 20 October 2013. The workplan shall address the Exposure Reduction Program objective, elements, and dischargers' coordination with other stakeholders. Dischargers shall integrate or, at a minimum, provide good-faith opportunities for integration of community-based organizations, tribes, and consumers of Delta fish into planning, decision making, and implementation of exposure reduction activities.

The dischargers shall implement the workplan by six months after Executive Officer approval of workplan. Every three years after workplan implementation begins, the dischargers, individually or collectively, shall provide a progress report to the Executive Officer. Dischargers shall participate in the Exposure Reduction Program until they comply with all requirements related to their individual or subarea methylmercury allocation.

The California Department of Public Health, the California Office of Environmental Health Hazard Assessment, and the local county public health and/or environmental health departments should collaborate with dischargers and community and tribal members to develop and implement exposure reduction programs and provide guidance to dischargers and others that are conducting such activities. The California Department of Public Health and/or other appropriate agency should seek funds to contribute to the Exposure Reduction Program and to continue it beyond 2030, if needed, until fish tissue objectives are attained.

The State Water Board should develop a statewide policy that defines the authority and provides guidance for exposure reduction programs, including guidance on addressing public health impacts of mercury, activities that reduce actual and potential exposure of, and mitigating health impacts to those people and communities most likely to be affected by mercury.

4.5.4.3.5.11 Exceptions for Low Threat Discharges

Discharges subject to a waiver of waste discharge requirements based on a finding that the discharges pose a low threat to water quality, except for discharges subject to water quality certifications, are exempt from the mercury requirements of this Delta Mercury Control Program.

Discharges subject to waste discharge requirements for dewatering and other low threat discharges to surface waters are exempt from the mercury requirements of this Delta Mercury Control Program.

TABLE 4-15 METHYLMERCURY LOAD AND WASTE LOAD ALLOCATIONS FOR EACH DELTA SUBAREA BY SOURCE CATEGORY														
DELTA SUBAREA														
Source Type	Central Delta		Marsh Creek		Mokelumne River		Sacramento River		San Joaquin River		West Delta		Yolo Bypass	
	Current Load (g/yr)	Allocation (g/yr)	Current Load (g/yr)	Allocation (g/yr)	Current Load (g/yr)	Allocation (g/yr)	Current Load (g/yr)	Allocation (g/yr)	Current Load (g/yr)	Allocation (g/yr)	Current Load (g/yr)	Allocation (g/yr)	Current Load (g/yr)	Allocation (g/yr)
	Methylmercury Load Allocations													
Agricultural drainage ^(d)	37	37	2.2	0.40	1.6	0.57	36	20	23	8.3	4.1	4.1	19	4.1
Atmospheric wet deposition	7.3	7.3	0.23	0.23	0.29	0.29	5.6	5.6	2.7	2.7	2.4	2.4	4.2	4.2
Open water	370	370	0.18	0.032	4.0	1.4	140	78	48	17	190	190	100	22
Tributary Inputs ^(a)	37	37	1.9	0.34	110	39	2,034	1,129	367	133			462	100
Inputs from Upstream Subareas	(b)	(b)	---	---	---	---	---	---	---	---	(b)	(b)	---	---
Urban (nonpoint source)	0.14	0.14	---	---	0.018	0.018	0.62	0.62	0.0022	0.0022	0.066	0.066	---	---
Wetlands ^(d)	210	210	0.34	0.061	30	11	94	52	43	16	130	130	480	103
Methylmercury Waste Load Allocations														
NPDES facilities ^(a)	1.3	1.3	0.086	0.086	0	0	162	90	40	15	0.0019	0.0019	1.0	0.42
NPDES facilities future growth ^(a)	---	0.32 ^(b)	---	0.21	---	0	---	8.6	---	2.1	---	0.25 ^(b)	---	0.60
NPDES MS4 ^(a)	5.4	5.4	1.2	0.30	0.045	0.016	2.8	1.6	4.8	1.7	3.2	3.2	1.5	0.38
Total Loads ^(c) (g/yr)	668	668	6.14	1.66	146	52.6	2,475	1,385	528	195	330	330	1,068	235

Table 4-15 Footnotes:

- (a) Values shown for Tributary Inputs, NPDES Facilities, NPDES Facilities Future Growth, and NPDES MS4 represent the sum of several individual discharges. See [Tables 4-16, 4-17, and 4-18](#) for allocations for the individual discharges that should be used for compliance purposes.
- (b) The Central Delta subarea receives flows from the Sacramento, Yolo Bypass, Mokelumne, and San Joaquin subareas. The West Delta subarea receives flows from the Central Delta and Marsh Creek subareas. These within-Delta flows have not yet been quantified because additional data are needed for loss rates across the subareas. Federal and state agencies whose activities affect methylmercury loss and production processes in the Delta and Yolo Bypass are assigned joint responsibility for the open water allocation. These subarea inflows are expected to decrease substantially (e.g., 40-80%) as upstream mercury management practices take place. As a result, reductions for sources within the Central and West subareas and tributaries that drain directly to these subareas are not required.
- (c) For each Delta subarea, the allocations in [Table 4-15](#) for agricultural drainage, atmospheric wet deposition, open water, urban (nonpoint source), and wetlands plus the individual allocations for tributary inputs ([Table 4-18](#)), NPDES facilities and NPDES facilities future growth ([Table 4-16](#)), and NPDES MS4 ([Table 4-17](#)) within that subarea equal the Delta subarea's TMDL (assimilative capacity).
- (d) The load allocations apply to the net methylmercury loads, where the net loads equal the methylmercury load in outflow minus the methylmercury loads in source water (e.g., irrigation water and precipitation).

TABLE 4-16
MUNICIPAL AND INDUSTRIAL WASTEWATER METHYLMERCURY (MEHG) ALLOCATIONS

PERMITTEE ^(a)	NPDES Permit No.	MeHg Waste Load Allocation ^(b) (g/yr)
Central Delta		
Discovery Bay WWTP	CA0078590	0.37
Lincoln Center Groundwater Treatment Facility	CA0084255	0.018
Lodi White Slough WWTP	CA0079243	0.94
Metropolitan Stevedore Company	CA0084174	(c)
Unassigned allocation for NPDES facility discharges	(d)	0.31
Marsh Creek		
Brentwood WWTP	CA0082660	0.14
Unassigned allocation for NPDES facility discharges	(d)	0.16
Sacramento River		
Rio Vista Northwest WWTP	CA0083771	0.069
Rio Vista WWTP	CA0079588	0.056
Sacramento Combined WWTP	CA0079111	0.53
SRCSD Sacramento River WWTP	CA0077682	89
Unassigned allocation for NPDES facility discharges	(d)	8.5
San Joaquin River		
Deuel Vocational Inst. WWTP	CA0078093	0.021
Manteca WWTP	CA0081558	0.38
Mountain House Community Services District WWTP	CA0084271	0.37
Oakwood Lake Subdivision Mining Reclamation ^(f)	CA0082783	0.38 ^(f)
Stockton WWTP	CA0079138	13
Tracy WWTP	CA0079154	0.77
Unassigned allocation for NPDES facility discharges	(d)	1.7
West Delta		
GWF Power Systems ^(e)	CA0082309	0.0052
Mirant Delta LLC Contra Costa Power Plant	CA0004863	(e)
Ironhouse Sanitation District	CA0085260	0.030
Unassigned allocation for NPDES facility discharges	(d)	0.22
Yolo Bypass		
Davis WWTP ^(g)	CA0079049	0.17 ^(g)
Woodland WWTP	CA0077950	0.43
Unassigned allocation for NPDES facility discharges	(d)	0.42

Table 4-16 Footnotes:

- (a) If NPDES facilities that have allocations in [Table 4-16](#) regionalize or consolidate, their waste load allocations can be summed.
- (b) Methylmercury waste load allocations apply to annual (calendar year) discharge methylmercury loads.
- (c) A methylmercury waste load allocation for non-storm water discharges from the Metropolitan Stevedore Company (CA0084174) shall be established in its NPDES permit once it completes three sampling events for methylmercury in its discharges. Its waste load allocation is a component of the “Unassigned Allocation” for the Central Delta subarea.
- (d) [Table 4-16](#) contains unassigned waste load allocations for new discharges to surface water that begin after 20 October 2011. New discharges that may be allotted a portion of the unassigned allocation may come from (1) existing facilities that previously discharged to land and then began to discharge to surface water or diverted discharges to another facility that discharges to surface water as part of ongoing regionalization efforts; (2) newly built facilities that have not previously discharged to land or water; and (3) expansions to existing facilities beyond their allocations listed in [Table 4-16](#) where the additional allocation does not exceed the product of the net increase in flow volume and 0.06 ng/l methylmercury. The sum of all new and/or expanded methylmercury discharges from NPDES facilities within each Delta subarea shall not exceed the Delta subarea-specific waste load allocation listed in [Table 4-16](#).
- (e) Methylmercury loads and concentrations in heating/cooling and power facility discharges vary with intake water conditions. To determine compliance with the allocations, dischargers that use ambient surface water for cooling water shall conduct concurrent monitoring of the intake water and effluent. The methylmercury allocations for such heating/cooling and power facility discharges are 100%, such that the allocations shall become the detected methylmercury concentration found in the intake water. GWF Power Systems (CA0082309) acquires its intake water from sources other than ambient surface water and therefore has a methylmercury allocation based on its effluent methylmercury load.
- (f) The waste load allocation for the Oakwood Lake Subdivision Mining Reclamation (CA0082783) shall be assessed as a five-year average annual methylmercury load.
- (g) The City of Davis WWTP (CA0079049) has two discharge locations; wastewater is discharged from Discharge 001 to the Willow Slough Bypass upstream of the Yolo Bypass and from Discharge 002 to the Conaway Ranch Toe Drain in the Yolo Bypass. The methylmercury load allocation listed in [Table 4-16](#) applies only to Discharge 002, which discharges seasonally from about February to June. Discharge 001 is encompassed by the Willow Slough watershed methylmercury allocation listed in [Table 4-18](#).

TABLE 4-17
MS4 METHYLMERCURY (MEHG) WASTE LOAD ALLOCATIONS
FOR URBAN RUNOFF WITHIN EACH DELTA SUBAREA

Permittee	NPDES Permit No.	MeHg Waste Load Allocation ^(a, b) (g/yr)
Central Delta		
Contra Costa (County of) ^(c)	CAS083313	0.75
Lodi (City of)	CAS000004	0.053
Port of Stockton MS4	CAS084077	0.39
San Joaquin (County of)	CAS000004	0.57
Stockton Area MS4	CAS083470	3.6
Marsh Creek		
Contra Costa (County of) ^(c)	CAS083313	0.30
Mokelumne River		
San Joaquin (County of)	CAS000004	0.016
Sacramento River		
Rio Vista (City of)	CAS000004	0.0078
Sacramento Area MS4	CAS082597	1.0
San Joaquin (County of)	CAS000004	0.11
Solano (County of)	CAS000004	0.041
West Sacramento (City of)	CAS000004	0.36
Yolo (County of)	CAS000004	0.041
San Joaquin River		
Lathrop (City of)	CAS000004	0.097
Port of Stockton MS4	CAS084077	0.0036
San Joaquin (County of)	CAS000004	0.79
Stockton Area MS4	CAS083470	0.18
Tracy (City of)	CAS000004	0.65
West Delta		
Contra Costa (County of) ^(c)	CAS083313	3.2
Yolo Bypass		
Solano (County of)	CAS000004	0.021
West Sacramento (City of)	CAS000004	0.28
Yolo (County of)	CAS000004	0.083

Table 4-17 Footnotes:

- (a) Some MS4s service areas span multiple Delta subareas and are therefore listed more than once. The allocated methylmercury loads for all MS4s are based on the average methylmercury concentrations observed in runoff from urban areas in or near the Delta during water years 2000 through 2003, a relatively dry period. Annual loads are expected to fluctuate with water volume and other factors. As a result, attainment of these allocations shall be assessed as a five-year average annual load. Allocations may be revised during review of the Delta Mercury Control Program to include available wet year data.
- (b) The methylmercury waste load allocations include all current and future permitted urban discharges not otherwise addressed by another allocation within the geographic boundaries of urban runoff management agencies within the Delta and Yolo Bypass, including but not limited to Caltrans facilities and rights-of-way (NPDES No. CAS000003), public facilities, properties proximate to banks of waterways, industrial facilities, and construction sites.
- (c) The Contra Costa County MS4 discharges to both the Delta and San Francisco Bay. The above allocations apply only to the portions of the MS4 service area that discharge to the Delta within the Central Valley Water Quality Control Board's jurisdiction.

TABLE 4-18
TRIBUTARY WATERSHED
METHYLMERCURY (MEHG) ALLOCATIONS

Tributary	MeHg Load Allocation ^(a) (g/yr)
Central Delta	
Bear Creek @ West Lane / Mosher Creek @ Morada Lane (sum of watershed loads)	11
Calaveras River @ railroad tracks u/s West Lane	26
Marsh Creek	
Marsh Creek @ Highway 4	0.34
Mokelumne River	
Mokelumne River @ Interstate 5	39.3 (39) ^(b)
Sacramento River	
Morrison Creek @ Franklin Boulevard	4.2
Sacramento River @ Freeport	1,125 (1,100) ^(b)
San Joaquin River	
French Camp Slough downstream of Airport Way	4.0
San Joaquin River @ Vernalis	129 (130) ^(b)
Yolo Bypass	
Cache Creek	30 ^(c)
Dixon Area	0.77
Fremont Weir	39
Knights Landing Ridge Cut	22
Putah Creek @ Mace Boulevard	2.4
Ulati Creek near Main Prairie Road	2.1
Willow Slough	3.9

Table 4-18 Footnotes:

- (a) Methylmercury allocations are assigned to tributary inputs to the Delta and Yolo Bypass. Mercury control programs designed to achieve the allocations for tributaries listed in [Table 4-18](#) will be implemented by future Basin Plan amendments. Methylmercury load allocations are based on water years 2000 through 2003, a relative dry period. Annual loads are expected to fluctuate with water volume and other factors. As a result, attainment of these allocations shall be assessed as a five-year average annual load. Allocations will be revised during review of the Delta Mercury Control Program to include available wet year data.
- (b) Tributary load allocations rounded to two significant figures for compliance evaluation.
- (c) The allocation for water from Cache Creek entering the Yolo Bypass in this table is designed to achieve fish tissue objectives in the Yolo Bypass and Delta established by the Delta Mercury Control Program. The allocation in [Table 4-11](#) assigned by the Cache Creek Mercury Control Program applies to the Cache Creek Settling Basin and requires a greater reduction so that fish within the Settling Basin can achieve water quality objectives for methylmercury in fish tissue that apply to Cache Creek, including the Settling Basin.

4.5.5 Pesticide Discharges

The control of pesticide discharges to surface waters from nonpoint sources will be achieved primarily by the development and implementation of management practices that minimize or eliminate the amount discharged. The Board will use water quality monitoring results to evaluate the effectiveness of control efforts and to help prioritize control efforts.

Regional Board monitoring will consist primarily of chemical analysis and biotoxicity testing of major water bodies receiving irrigation return flows. The focus will be on pesticides with use patterns and chemical characteristics that indicate a high probability of entering surface waters at levels that may impact beneficial uses. Board staff will advise other agencies that conduct water quality and aquatic biota monitoring of high priority chemicals, and will review monitoring data developed by these agencies. Review of the impacts of "inert" ingredients contained in pesticide formulations will be integrated into the Board's pesticide monitoring program.

When a pesticide is detected more than once in surface waters, investigations will be conducted to identify sources. Priority for investigation will be determined through consideration of the following factors: toxicity of the compound, use patterns and the number of detections. These investigations may be limited to specific watersheds where the pesticide is heavily used or local practices result in unusually high discharges. Special studies will also be conducted to determine pesticide content of sediment and aquatic life when conditions warrant. Other agencies will be consulted regarding prioritization of monitoring projects, protocol, and interpretation of results.

The Board recognizes that implementation of the authorities of agencies that regulate pesticide use, including CDPR, USEPA Office of Pesticide Programs, and County Agricultural Commissioners, should be one of the primary mechanisms for addressing pesticide-caused water quality impairments. To ensure that new pesticides do not create a threat to water quality, the Board, either directly or through the State Water Resources Control Board, will review the pesticides that are processed through the Department of Pesticide Regulation's (DPR) registration program. Where use of the pesticide may result in a discharge to surface waters, the Board staff will make efforts to ensure that label instructions or use restrictions require management practices that will result in compliance with water quality objectives. When the Board determines that despite any actions taken by DPR, use of the pesticide may result in discharge to surface waters in violation of the objectives, the Board will take regulatory action, such as adoption of a prohibition of discharge or issuance of waste discharge requirements to control discharges of the pesticide. Monitoring may be required to verify that management practices are effective in protecting water quality.

The Board will notify pesticide dischargers through public notices, educational programs and DPR of the water quality objectives related to pesticide discharges. Dischargers will be advised to implement management practices that result in full compliance with these objectives by 1 January 1993, unless required to do so earlier. (Dischargers of carbofuran, malathion, methyl parathion, molinate and thiobencarb must meet the requirements detailed in the Prohibitions section.) During this time period, dischargers will remain legally responsible for the impacts caused by their discharges.

The Board will conduct reviews of the management practices being followed to verify that they produce discharges that comply with water quality objectives. It is anticipated that practices associated with one or two pesticides can be reviewed each year. Since criteria, control methods and other factors are subject to change, it is also anticipated that allowable management practices will change over time, and control practices for individual pesticides will have to be reevaluated periodically.

Public hearings will be held at least once every two years to review the progress of the pesticide control program. At these hearings, the Board will

- review monitoring results and identify pesticides of greatest concern,
- review changes or trends in pesticide use that may impact water quality,
- consider approval of proposed management practices for the control of pesticide discharges,
- set the schedule for reviewing management practices for specific pesticides, and
- consider enforcement action.

After reviewing the testimony, the Board will place the pesticides into one of the following three classifications. When compliance with water quality objectives and performance goals is not obtained within the timeframes allowed, the Board will consider alternate control options, such as prohibition of discharge or issuance of waste discharge requirements.

- (1) Where the Board finds that pesticide discharges pose a significant threat to drinking water supplies or other beneficial uses, it will request DPR to act to prevent further impacts. If DPR does not proceed with such action(s) within six months of the Board's request, the Board will act within a reasonable time period to place restrictions on the discharges.
- (2) Where the Board finds that currently used discharge management practices are resulting in violations of water quality objectives, but the impacts of the discharge are not so severe as to require immediate changes, dischargers will be given three years, with a possibility of three one year time extensions depending on the circumstances involved, to develop and implement practices that will meet the objectives. During this period of time, dischargers may be required to take interim steps, such as meeting Board established performance goals to reduce impacts of the discharges. Monitoring will be required to show that the interim steps and proposed management practices are effective.
- (3) The Board may approve the management practices as adequate to meet water quality objectives. After the Board has approved specific management practices for the use and discharge of a pesticide, no other management practice may be used until it has been reviewed by the Board and found to be equivalent to or better than previously approved practices. Waste discharge requirements will be waived for irrigation return water per Resolution No. 82-036 if the Board determines that the management practices are adequate to meet water quality objectives and meet the conditions of the waiver policy. Enforcement action may be taken against those who do not follow management practices approved by the Board.

Carbofuran, malathion, methyl parathion, molinate and thiobencarb have been detected in surface waters at levels that impact aquatic organisms. Review of management practices associated with these materials is under way and is expected to continue for at least another two years. A timetable of activities related to these pesticides is at the end of the Prohibitions section. A detailed assessment of the impacts of these pesticides on aquatic organisms is also being conducted and water quality objectives will be adopted for these materials by the State or Regional Board by the end of 1993.

In conducting a review of pesticide monitoring data, the Board will consider the cumulative impact if more than one pesticide is present in the water body. This will be done by initially assuming that the toxicities of pesticides are additive. This will be evaluated separately for each beneficial use using the following additive. This will be evaluated separately for each beneficial use using the following formula:

$$\frac{C_1}{O_1} + \frac{C_2}{O_2} + \dots + \frac{C_i}{O_i} = S$$

Where:

- C = The concentration of each pesticide.
- O = The water quality objective or criterion for the specific beneficial use for each pesticide present, based on the best available information. Note that the numbers must be acceptable to the Board and performance goals are not to be used in this equation.
- S = The sum. A sum exceeding one (1.0) indicates that the beneficial use may be impacted.

The above formula will not be used if it is determined that it does not apply to the pesticides being evaluated. When more than one pesticide is present, the impacts may not be cumulative or they may be additive, synergistic or antagonistic. A detailed assessment of the pesticides involved must be conducted to determine the exact nature of the impacts.

For most pesticides, numerical water quality objectives have not been adopted. USEPA criteria and other guidance are also extremely limited. Since this situation is not likely to change in the near future, the Board will use the best available technical information to evaluate compliance with the narrative objectives. Where valid testing has developed 96 hour LC50 values for aquatic organisms (the concentration that kills one half of the test organisms in 96 hours), the Board will consider one tenth of this value for the most sensitive species tested as the upper limit (daily maximum) for the protection of aquatic life. Other available technical information on the pesticide (such as Lowest Observed Effect Concentrations and No Observed Effect Levels), the water bodies and the organisms involved will be evaluated to determine if lower concentrations are required to meet the narrative objectives.

To ensure the best possible program, the Board will coordinate its pesticide control efforts with other agencies and organizations. Wherever possible, the burdens on pesticide dischargers will be reduced by working through the DPR or other appropriate regulatory processes. The Board may also designate another agency or organization as the responsible party for the development and/or implementation of management practices, but it will retain overall review and control authority. The Board will work with water agencies and others whose activities may influence pesticide levels to minimize concentrations in surface waters.

Since the discharge of pesticides into surface waters will be allowed under certain conditions, the Board will take steps to ensure that this control program is conducted in compliance with the federal and state antidegradation policies. This will primarily be done as pesticide discharges are evaluated on a case by case basis.

4.5.5.1 Diazinon and Chlorpyrifos Runoff into the Sacramento and Feather Rivers

- (1) The Sacramento and Feather River pesticide runoff control program shall:

- (a) ensure compliance with water quality objectives applicable to diazinon and chlorpyrifos water quality objectives in the Sacramento and Feather Rivers through the implementation of management practices;
 - (b) ensure that measures that are implemented to reduce discharges of diazinon and chlorpyrifos do not lead to an increase in the discharge of other pesticides to levels that cause or contribute to violations of applicable water quality objectives and Regional and State Water Board policies; and
 - (c) ensure that discharges of pesticides to surface waters are controlled so that the pesticide concentrations are at the lowest levels that are technically and economically achievable.
- (2) Dischargers must consider whether a proposed alternative to diazinon or chlorpyrifos has the potential to degrade ground or surface water. If the alternative to diazinon or chlorpyrifos has the potential to degrade ground water, alternative pest control methods must be considered. If the alternative to diazinon or chlorpyrifos has the potential to degrade surface water, control measures must be implemented to ensure that applicable water quality objectives and Regional Water and State Board policies are not violated, including State Water Resources Control Board Resolution 68-16.
- (3) Compliance with water quality objectives, waste load allocations, and load allocations for diazinon and chlorpyrifos in the Sacramento and Feather Rivers is required by August 11, 2008.
- The water quality objectives and allocations will be implemented through the adoption or modification of waivers of waste discharge requirements, and general or individual waste discharge requirements where provisions necessary for implementation are not already in place.
- (4) The Regional Water Board will review the diazinon and chlorpyrifos allocations and the implementation provisions in the Basin Plan no later than 30 June 2013.
- (5) Regional Water Board staff will meet at least annually with staff from the Department of Pesticide Regulation and representatives from the California Agricultural Commissioners and Sealers Association to review pesticide use and instream pesticide concentrations during the dormant spray and irrigation application season and to consider the effectiveness of management measures in meeting water quality objectives and load allocations.
- (6) The Waste Load Allocations (WLA) for all NPDES-permitted dischargers, Load Allocations (LA) for nonpoint source discharges, and the Loading Capacity of the Sacramento and Feather Rivers shall not exceed the sum (S) of one (1) as defined below.

$$S = \frac{C_D}{WQO_D} + \frac{C_C}{WQO_C} \leq 1.0$$

where

C_D = diazinon concentration in $\mu\text{g/L}$ of point source discharge for the WLA; nonpoint source discharge for the LA; or the Sacramento or Feather Rivers for the LC.

- C_c = chlorpyrifos concentration in $\mu\text{g/L}$ of point source discharge for the WLA; nonpoint source discharge for the LA; or the Sacramento or Feather Rivers for the LC.
- WQO_D = acute or chronic diazinon water quality objective in $\mu\text{g/L}$.
- WQO_C = acute or chronic chlorpyrifos water quality objective in $\mu\text{g/L}$.

Available samples collected within the applicable averaging period for the water quality objective will be used to determine compliance with the allocations and loading capacity. Prior to performing any averaging calculations, only chlorpyrifos and diazinon results from the same sample will be used in calculating the sum (S). For purposes of calculating the sum (S) above, analytical results that are reported as “nondetectable” concentrations are considered to be zero.

Compliance with the load allocations will be determined where the nonpoint source discharges into the Sacramento or Feather Rivers.

- (7) The established waste load and load allocations for diazinon and chlorpyrifos and the water quality objectives for diazinon and chlorpyrifos in the Sacramento and Feather Rivers represent a maximum allowable level. The Regional Water Board shall require any additional reductions in diazinon or chlorpyrifos levels necessary to account for additive or synergistic toxicity effects or to protect beneficial uses in tributary waters.
- (8) Pursuant to CWC §13267, the Executive Officer will require dischargers to submit a management plan that describes the actions that the discharger will take to reduce diazinon and chlorpyrifos discharges and meet the applicable allocations.

The management plan may include actions required by State and federal pesticide regulations. The Executive Officer will require the discharger to document the relationship between the actions to be taken and the expected reductions in diazinon and chlorpyrifos discharge(s). The Executive Officer will allow individual dischargers or a discharger group or coalition to submit management plans.

The management plan must comply with the provisions of any applicable waiver of waste discharge requirements or waste discharge requirements. The Executive Officer may require revisions to the management plan if compliance with applicable allocations is not attained or the management plan is not reasonably likely to attain compliance. When requiring any revisions to the management plan, the Executive Officer may consider the relative contributions of diazinon and chlorpyrifos to the lack of compliance with the allocations.

- (9) Any waiver of waste discharge requirements or waste discharge requirements that govern the control of pesticide runoff that is discharged directly or indirectly into the Sacramento or Feather Rivers must be consistent with the policies and actions described in paragraphs 1-8.
- (10) In determining compliance with the waste load allocations, the Regional Water Board will consider any data or information submitted by the discharger regarding diazinon and chlorpyrifos inputs from sources outside of the jurisdiction of the permitted discharge, including any diazinon and chlorpyrifos present in precipitation; and any applicable provisions in the discharger’s NPDES permit requiring the discharger to reduce the discharge of pollutants to the maximum extent practicable.
- (11) The above provisions for control of diazinon and chlorpyrifos discharges apply to the Sacramento and Feather Rivers as described in [Table 3-4](#).

4.5.5.2 Diazinon and Chlorpyrifos Runoff in the San Joaquin River Basin

- (1) The pesticide runoff control program shall:
 - (a) Ensure compliance with water quality objectives applicable to diazinon and chlorpyrifos in the San Joaquin River through the implementation of management practices.
 - (b) Ensure that measures that are implemented to reduce discharges of diazinon and chlorpyrifos do not lead to an increase in the discharge of other pesticides to levels that cause or contribute to violations of applicable water quality objectives and Regional Water Board policies; and
 - (c) Ensure that discharges of pesticides to surface waters are controlled so that pesticide concentrations are at the lowest levels that are technically and economically achievable.
- (2) Dischargers must consider whether a proposed alternative to diazinon or chlorpyrifos has the potential to degrade ground or surface water. If the alternative has the potential to degrade groundwater, alternative pest control methods must be considered. If the alternative has the potential to degrade surface water, control measures must be implemented to ensure that applicable water quality objectives and Regional Water Board policies are not violated, including State Water Resources Control Board Resolution 68-16.
- (3) Compliance with applicable water quality objectives, load allocations, and waste load allocations for diazinon and chlorpyrifos in the San Joaquin River is required by 1 December 2010.

The water quality objectives and allocations will be implemented through one or a combination of the following: the adoption of one or more waivers of waste discharge requirements, and general or individual waste discharge requirements. To the extent not already in place, the Regional Water Board expects to adopt or revise the appropriate waiver(s) or waste discharge requirements by 31 December 2007.

- (4) The Regional Water Board intends to review the diazinon and chlorpyrifos allocations and the implementation provisions in the Basin Plan at least once every five years, beginning no later than 31 December 2009.
- (5) Regional Water Board staff will meet at least annually with staff from the Department of Pesticide Regulation and representatives from the California Agricultural Commissioners and Sealers Association to review pesticide use and instream pesticide concentrations during the dormant spray and irrigation application seasons, and to consider the effectiveness of management measures in meeting water quality objectives and load allocations.
- (6) The Waste Load Allocations (WLA) for all NPDES-permitted dischargers, Load Allocations (LA) for nonpoint source discharges, and the Loading Capacity of the San Joaquin River from the Mendota Dam to Vernalis shall not exceed the sum (S) of one (1) as defined below.

$$S = \frac{C_D}{WQO_D} + \frac{C_C}{WQO_C} \leq 1.0$$

where

- C_D = diazinon concentration in $\mu\text{g/L}$ of point source discharge for the WLA; nonpoint source discharge for the LA; or San Joaquin River for the LC.
 C_C = chlorpyrifos concentration in $\mu\text{g/L}$ of point source discharge for the WLA; nonpoint source discharge for the LA; or San Joaquin River for the LC.
 WQO_D = acute or chronic diazinon water quality objective in $\mu\text{g/L}$.
 WQO_C = acute or chronic chlorpyrifos water quality objective in $\mu\text{g/L}$.

Available samples collected within the applicable averaging period for the water quality objective will be used to determine compliance with the allocations and loading capacity. For purposes of calculating the sum (S) above, analytical results that are reported as “non-detectable” concentrations are considered to be zero.

- (7) At a minimum, Loading Capacity shall be calculated for each of the following six water quality compliance points in the San Joaquin River:
- San Joaquin River at the Airport Way Bridge near Vernalis (United States Geological Survey (USGS) Identification Number 11303500)
 - San Joaquin River at the Maze Boulevard (Highway 132) Bridge (USGS Identification Number 11290500)
 - San Joaquin River at Las Palmas Avenue near Patterson (USGS Identification Number 11274570)
 - San Joaquin River at Hills Ferry Road
 - San Joaquin River at Highway 165 near Stevinson (USGS Identification Number 11260815)
 - San Joaquin River at Sack Dam

The load allocations for non-point source discharges into the San Joaquin River are assigned to the following subareas:

- (a) The combined Stanislaus River; North Stanislaus; and Vernalis North subareas.
- (b) The combined Tuolumne River; Northeast Bank; and Westside Creek subareas.
- (c) The combined Turlock; Merced; and Greater Orestimba subareas.
- (d) The combined Stevinson and Grassland subareas.
- (e) The combined Bear Creek and Fresno-Chowchilla subareas.

The established waste load and load allocations for diazinon and chlorpyrifos, and the water quality objectives for chlorpyrifos and diazinon in the San Joaquin River represent a maximum allowable level. The Regional Water Board shall require any additional reductions in diazinon and chlorpyrifos levels necessary to account for additional additive or synergistic toxicity effects or to protect beneficial uses in tributary waters.

- (8) Pursuant to CWC Section 13267, the Executive Officer will require dischargers to submit a management plan that describes the actions that the discharger will take to reduce diazinon and chlorpyrifos discharges and meet the applicable allocations by the required compliance date.

The management plan may include actions required by State and federal pesticide regulations. The Executive Officer will require the discharger to document the relationship between the actions to be taken and the expected reductions in diazinon and chlorpyrifos discharges. The Executive Officer will allow individual dischargers or a discharger group or coalition to submit management plans.

The management plan must comply with the provisions of any applicable waiver of waste discharge requirements or waste discharge requirements.

The Executive Officer may require revisions to the management plan if compliance with applicable allocations is not attained or the management plan is not reasonably likely to attain compliance.

- (9) If the loading capacity in the San Joaquin River is not being met by the compliance date, dischargers in subareas where load allocations are not being met will be required to revise their management plans and implement an improved complement of management measures to meet the loading capacity.
- (10) Any waiver of waste discharge requirements or waste discharge requirements that govern the control of pesticide runoff that is discharged directly or indirectly into the San Joaquin River must be consistent with the policies and actions described in paragraphs 1 - 9.
- (11) In determining compliance with the waste load allocations, the Regional Water Board will consider any data or information submitted by the discharger regarding diazinon and chlorpyrifos inputs from sources outside of the jurisdiction of the permitted discharger, including any diazinon and chlorpyrifos present in precipitation, and other available relevant information; and any applicable provisions in the discharger's NPDES permit requiring the discharger to reduce the discharge of pollutants to the maximum extent possible.

4.5.5.3 Diazinon and Chlorpyrifos Runoff into the Sacramento-San Joaquin Delta Waterways (as identified in Appendix 42)

- (1) The pesticide runoff control program shall:
 - (a) Ensure compliance with water quality objectives applicable to diazinon and chlorpyrifos in the Sacramento-San Joaquin Delta Waterways through the implementation of management practices.
 - (b) Ensure that measures that are implemented to reduce discharges of diazinon and chlorpyrifos do not lead to an increase in the discharge of other pesticides to levels that cause or contribute to violations of applicable water quality objectives and Regional Water Board plans and policies, and
 - (c) Ensure that discharges of pesticides to surface waters are controlled so that pesticide concentrations are at the lowest levels that are technically and economically achievable.
- (2) Dischargers must consider whether any proposed alternative to the use of diazinon or chlorpyrifos has the potential to degrade ground or surface water. If the alternative has the potential to degrade groundwater, alternative pest control methods must be considered. If the alternative has the potential to degrade surface water, control measures must be implemented to ensure that applicable water quality objectives and Regional Water Board plans and policies are not violated, including State Water Resources Control Board Resolution 68-16.
- (3) Compliance with applicable water quality objectives, load allocations, and waste load allocations for diazinon and chlorpyrifos in the Delta Waterways is required by December 1, 2011.

The water quality objectives and allocations will be implemented through one or a combination of the following: the adoption of one or more waivers of waste discharge

requirements, and general or individual waste discharge requirements. To the extent not already in place, the Regional Water Board expects to adopt or revise the appropriate waiver(s) or waste discharge requirements by December 31, 2009.

- (4) The Regional Water Board intends to review the diazinon and chlorpyrifos allocations and the implementation provisions in the Basin Plan at least once every five years, beginning no later than December 31, 2010.
- (5) Regional Water Board staff will meet at least annually with staff from the Department of Pesticide Regulation and representatives from the California Agricultural Commissioners and Sealers Association to review pesticide use and instream pesticide concentrations during the dormant spray and irrigation application seasons and to consider the effectiveness of management measures in meeting water quality objectives and load allocations.
- (6) The waste load allocations (WLA) for all NPDES-permitted dischargers, load allocations (LA) for nonpoint source discharges, and the loading capacity (LC) of each of the Sacramento-San Joaquin Delta Waterways defined in Appendix 42 shall not exceed the sum (S) of one (1) as defined below.

$$S = \frac{C_D}{WQO_D} + \frac{C_C}{WQO_C} \leq 1.0$$

where

- C_D = diazinon concentration in $\mu\text{g/L}$ of point source discharge for the WLA; nonpoint source discharge for the LA; or a Delta Waterway for the LC.
- C_C = chlorpyrifos concentration in $\mu\text{g/L}$ of point source discharge for the WLA; nonpoint source discharge for the LA; or a Delta Waterway for the LC.
- WQO_D = acute or chronic diazinon water quality objective in $\mu\text{g/L}$.
- WQO_C = acute or chronic chlorpyrifos water quality objective in $\mu\text{g/L}$.

Available samples collected within the applicable averaging period for the water quality objective will be used to determine compliance with the allocations and loading capacity. For purposes of calculating the sum (S) above, analytical results that are reported as “non-detectable” concentrations are considered to be zero.

- (7) The established waste load and load allocations for diazinon and chlorpyrifos, and the water quality objectives for chlorpyrifos and diazinon in the Delta Waterways represent a maximum allowable level. The Regional Water Board shall require any additional reductions in diazinon and chlorpyrifos levels necessary to account for additional additive or synergistic toxicity effects or to protect beneficial uses in tributary waters.
- (8) Pursuant to CWC Section 13267, the Executive Officer will require dischargers to submit a management plan that describes the actions that the discharger will take to reduce diazinon and chlorpyrifos discharges and meet the applicable allocations by the required compliance date. The management plan may include actions required by State and Federal pesticide regulations. The Executive Officer will require the discharger to document the relationship between the actions to be taken and the expected reductions in diazinon and chlorpyrifos discharges. The Executive Officer will allow individual dischargers or a discharger group or coalition to submit management plans. The management plan must comply with the provisions of any applicable waiver of waste discharge requirements or waste discharge requirements. The Executive Officer may

require revisions to the management plan if compliance with applicable allocations is not attained or the management plan is not reasonably likely to attain compliance.

- (9) If the loading capacity in one or more Delta Waterways is not being met by the compliance date, direct or indirect dischargers to the those waterways whose discharge exceeds their load allocation will be required to revise their management plans and implement an improved complement of management measures to meet the loading capacity.
- (10) Any waiver of waste discharge requirements or waste discharge requirements that govern the control of pesticide runoff that is discharged directly or indirectly into the Delta Waterways must be consistent with the policies and actions described in paragraphs 1 – 9.
- (11) In determining compliance with the waste load allocations, the Regional Water Board will consider any data or information submitted by the discharger regarding diazinon and chlorpyrifos inputs from sources outside of the jurisdiction of the permitted discharger, including any diazinon and chlorpyrifos present in precipitation and other available relevant information; and any applicable provisions in the discharger's NPDES permit requiring the discharger to reduce the discharge of pollutants to the maximum extent possible.
- (12) The above provisions for control of diazinon and chlorpyrifos discharges to the Delta Waterways do not apply to dischargers to the Sacramento and San Joaquin Rivers upstream of the Delta.

4.5.5.4 Diazinon and Chlorpyrifos Discharges

- (1) The diazinon and chlorpyrifos discharge control program shall:
 - (a) Ensure compliance with water quality objectives for diazinon and chlorpyrifos in the Sacramento and San Joaquin River Basins through the implementation of management practices;
 - (b) Ensure measures that are implemented to reduce discharges of diazinon and/or chlorpyrifos do not lead to an increase in the discharge of other pesticides to levels that cause or contribute to exceedances of applicable water quality objectives.
 - (c) Encourage implementation of measures or practices by all dischargers that result in concentrations of chlorpyrifos and diazinon in all discharges that are below the water quality objective concentrations.
- (2) Dischargers are responsible for ensuring that their pesticide discharges to surface water and groundwater, including discharges of pesticides used as alternatives to diazinon and/or chlorpyrifos do not cause or contribute to exceedance of applicable water quality objectives.
- (3) Except as otherwise stated in the Basin Plan, compliance with water quality objectives for diazinon and chlorpyrifos shall be as soon as practicable. The Regional Board shall establish time schedules for compliance with such objectives in Waste Discharge Requirements or waivers in accordance with existing laws and policies. Where no existing law or policy directs the length of the compliance schedule, discharges shall be

reduced to ensure compliance with the proposed water quality objectives not later than 16 August 2027.

The Board will ensure that dischargers will comply with diazinon and chlorpyrifos water quality objectives by modifying existing waste discharge requirements and existing waivers (where provisions necessary for implementation are not already in place), by adopting new waste discharge requirements or waivers, or by enforcing the diazinon and chlorpyrifos discharge prohibition. If necessary, the Board will ensure that existing waste discharge requirements and waivers will be modified as soon as possible, but no later than 16 August 2022.

- (4) The Central Valley Water Board intends to review the diazinon and chlorpyrifos implementation provisions in the Basin Plan no later than 16 August 2024.
- (5) The water quality objectives for diazinon and chlorpyrifos represent a maximum allowable level and shall be considered additively as defined by the Policy for Application of Water Quality Objectives (Section 4.2.2.1.9). The Board shall require additional reductions in diazinon or chlorpyrifos levels if such reductions are necessary to account for additive or synergistic toxicity effects or to protect beneficial uses.
- (6) The Executive Officer shall require agricultural dischargers that discharge diazinon and/or chlorpyrifos to water bodies listed in [Table 3-4](#) Applicable Water Bodies that are not attaining the diazinon and/or chlorpyrifos objective(s) to submit management plans. These management plans shall consider the watershed of the water body that is not attaining the objective(s) and must describe actions that the agricultural discharger will take to meet applicable diazinon and chlorpyrifos water quality objectives by the required compliance dates. Management plans must describe:

The causes of the nonattainment of objectives;

- (b) The actions that the discharger will take to reduce diazinon and/or chlorpyrifos discharges in order to meet the diazinon and/or chlorpyrifos water quality objectives as soon as practicable but no later than 16 August 2027.
- (c) A schedule for the implementation of those actions;
- (d) A monitoring plan to track effectiveness of pollution controls; and
- (e) A commitment to revise pollution controls, as necessary.

Management plans for water bodies not attaining the water quality objective(s) as of 16 August 2017 are due no later than 16 August 2018. Management plans that address diazinon and/or chlorpyrifos exceedances and that have already been submitted can be used to fulfill this requirement, provided that they contain all the required elements 6a through 6e described above.

After 16 August 2017, if the Executive Officer determines that a water body listed in [Table 3-4](#) Applicable Water Bodies is exceeding an applicable diazinon and/or chlorpyrifos water quality objective, the Executive Officer shall require that dischargers that discharge diazinon and/or chlorpyrifos to that water body submit a management plan to the Board. Management plans are due within one year after the discharger receives notification that such a determination has been made.

If a water body that is exceeding the diazinon and/or chlorpyrifos objective(s) is being used by a discharger to represent water quality conditions in multiple water bodies, the Executive Officer shall require the submittal of a management plan that addresses all of the represented water bodies.

Management plans may include actions required under state and federal pesticide laws and regulations. Management plans must include documentation of the relationship between the actions to be taken and reductions in diazinon and/or chlorpyrifos discharges that are reasonably likely to attain compliance with diazinon and chlorpyrifos water quality objectives. The Executive Officer may allow individual dischargers or a discharger group or coalition to submit management plans. The management plan must comply with the provisions of any applicable waste discharge requirements or waiver. Management plans may address discharges to multiple downstream water bodies for which discharge reductions are required. The Executive Officer may require revisions to the management plan if compliance with applicable water quality objectives is not attained.

- (7) Any waste discharge requirements or waivers that govern the control of pesticide discharges to [Table 3-4](#) Applicable Water Bodies, must be consistent with the policies and actions described in paragraphs 1-6 of this section.

4.5.6 Dredging in the Sacramento River and San Joaquin River Basins

Large volumes of sediment are transported in the waters of the Sacramento and San Joaquin Rivers which drain the Central Valley. The average annual sediment load to San Francisco Bay from these two rivers is estimated to be 8 million cubic yards. Dredging and riverbank protection projects are ongoing, continuing activities necessary to keep ship channels open, prevent flooding, and control riverbank erosion. The Delta, with over 700 miles of waterways, is a major area of activity. At present, the Corps is overseeing the conduct and planning of rehabilitation work along 165 miles of levees surrounding 15 Delta islands. In addition, virtually all of the Delta levees have been upgraded by island owners or reclamation districts. The magnitude of recent operations, such as the Stockton and Sacramento Ship Channel Deepening Projects and Sacramento River Bank Protection Project, is discussed in recent U.S. Army Corps of Engineers Reports. For example, the Corps removes over 10 million cubic yards of sediment yearly from the Sacramento River. If the Sacramento River Deep Water Ship Channel is widened and deepened as proposed currently, 25 million cubic yards of bottom material will be removed from the river during the 5-year project.

Environmental impacts of dredging operations and materials disposal include temporary dissolved oxygen reduction, increased turbidity and, under certain conditions, the mobilization of toxic chemicals and release of biostimulatory substances from the sediments. The direct destruction and burial of spawning gravels and alteration of benthic habitat may be the most severe impacts. The existing regulatory process must be consistently implemented to assure protection of water quality and compliance with the certification requirements of Section 401 of the Federal Clean Water Act.

The Regional Water Board continues to work with dredging interests in the San Francisco Bay and Delta to develop a long term management strategy (LTMS) for handling dredge spoils. We will adopt requirements for all significant dredging operations and upland disposal projects in the Region.

4.5.7 Nitrate Pollution of Ground Water in the Sacramento and San Joaquin River Basins

Since 1980, over 200 municipal supply wells have been closed in the Central Valley because of nitrate levels exceeding the State's 45 mg/l drinking water standard. Proposals have been

submitted to assess the extent of the problem and explore possible regulatory responses, but without success. The increasing population growth in the Valley is expected to accelerate the problem's occurrence in the years ahead.

The Regional Water Board considers nitrate pollution to be a critical issue for beneficial use protection in the Central Valley Region. Staff will continue efforts to obtain study funds. Since nitrate pollution of ground water is not restricted to the Central Valley Region, the Regional Water Board recommends the State Water Board take the lead in developing programs for controlling ground water contamination resulting from the use of nitrogen fertilizer on irrigated crops.

4.5.8 Temperature and Turbidity Increases Below Large Water Storage and Diversion Projects in the Sacramento River Basin

The storage and diversion of water for hydroelectric and other purposes can impact downstream beneficial uses because of changes in temperature and the introduction of turbidity. There are several large facilities in the Basin which have had a history of documented or suspected downstream impairments.

Where problems have been identified, the staff will work with operators to prepare management agency agreements or make recommendations to State Water Board regarding requirements to remedy the problems. Where problems are suspected, the staff will seek additional monitoring.

4.5.9 Control Program for Factors Contributing to the Dissolved Oxygen Impairment in the Stockton Deep Water Ship Channel (DWSC) (Regional Water Board Resolution No. R5-2005-0005)

The purpose of this control program is to implement a dissolved oxygen TMDL to achieve compliance with the Basin Plan dissolved oxygen water quality objectives in the DWSC. The numeric targets for this TMDL are the existing dissolved oxygen water quality objectives.

The dissolved oxygen impairment in the DWSC is caused by the following three main contributing factors:

- Loads of oxygen demanding substances from upstream sources that react by numerous chemical, biological, and physical mechanisms to remove dissolved oxygen from the water column in the DWSC.
- Geometry of the DWSC that impacts various mechanisms that add or remove dissolved oxygen from the water column, such that net oxygen demand exerted in the DWSC is increased.
- Reduced flow through the DWSC impacts various mechanisms that add or remove dissolved oxygen from the water column, such that net oxygen demand exerted in the DWSC is increased.

For the purpose of this control program, net oxygen demand is defined as the combined impact of all chemical, biological, and physical mechanisms that add or remove dissolved oxygen from the water column. When the amount of oxygen removed from the water column is greater than the amount added there is a decrease in the dissolved oxygen concentration. When dissolved oxygen concentrations in the DWSC are below Basin Plan objectives, the assimilative capacity

of the water column has been exceeded and the associated excess net oxygen demand (ENOD) is given by the equation:

$$\text{ENOD} = \{\text{DO}_{\text{obj}} - \text{DO}_{\text{meas}}\} \times \{\text{Q}_{\text{DWSC}} + 40\} \times 5.4$$

In the above equation DO_{obj} is the applicable Basin Plan dissolved oxygen objective in milligrams per liter, DO_{meas} is the measured dissolved oxygen concentration in the DWSC in milligrams per liter, Q_{DWSC} is the net daily flow rate through the DWSC in cubic feet per second (adjusted by 40 cfs to account for flow measurement error), and 5.4 is a unit conversion factor that provides ENOD in units of pounds of net oxygen demand per day in the DWSC.

To account for technical uncertainty a margin of safety (MOS) equal to 20% of ENOD is added to the overall required reduction of ENOD:

$$\text{MOS} = -0.2 \times \text{ENOD}$$

ENOD plus the MOS must be addressed by those collectively responsible for each of the three contributing factors:

$$\text{ENOD} - \text{MOS} = 1.2 \times \text{ENOD} = [\Sigma\text{WLA} + \Sigma\text{LA}] + \text{R}_{\text{DWSC}} + \text{R}_{\text{Flow}}$$

where $[\Sigma\text{WLA} + \Sigma\text{LA}]$ is the amount of ENOD and MOS for which sources of oxygen demanding substances are responsible, R_{DWSC} is the amount of ENOD and MOS for which DWSC geometry is responsible, and R_{Flow} is the amount of ENOD and MOS for which reduced DWSC flow is responsible.

This TMDL does not specify the relative responsibility among the three contributing factors. Each of the three contributing factors are considered to be 100% responsible for addressing ENOD and MOS. Those parties collectively responsible for each contributing factor must coordinate with those collectively responsible for the other factors to implement control measures addressing ENOD and MOS.

Those parties responsible for sources of oxygen demanding substances $[\Sigma\text{WLA} + \Sigma\text{LA}]$ are allocated relative responsibility for excess net oxygen demand as follows:

- (1) 30% as a waste load allocation for the City of Stockton Regional Wastewater Control Facility.
- (2) 60% as a load allocation to non-point sources of algae and/or precursors in the watershed.
- (3) 10% as a reserve for unknown sources and impacts, and known or new sources that have no reasonable potential to impact.

In measuring compliance with waste load and load allocations, credit will be given for control measures implemented after 12 July 2004.

For the purpose of this control program, non-point source discharges are discharges from irrigated lands. Irrigated lands are lands where water is applied for producing crops and, for the purpose of this control program, includes, but is not limited to, land planted to row, field, and tree crops, as well as commercial nurseries, nursery stock production, managed wetlands and rice production.

For the purpose of this control program, oxygen demanding substances and their precursors are any substance or substances that consume, have the potential to consume, or contribute to the

growth or formation of substances that consume or have the potential to consume oxygen from the water column.

The source area for loads of oxygen demanding substances and their precursors being addressed by this TMDL includes the SJR watershed that drains downstream of Friant Dam and upstream of the confluence of the San Joaquin River and Disappointment Slough, with the exception of the western slope of the Sierra Nevada foothills above the major reservoirs of New Melones Lake on the Stanislaus, Don Pedro Reservoir on the Tuolumne, Lake McClure on the Merced, New Hogan Reservoir on the Calaveras, Comanche Reservoir on the Mokelumne, and those portions of the SJR watershed that fall within Mariposa, Tuolumne, Calaveras, and Amador Counties.

Measures will also need to be implemented to reduce the impact of both the DWSC geometry and reduced flow through the DWSC.

The Regional Water Board will take the following actions, as necessary and appropriate, to implement this TMDL:

- (1) The Regional Water Board will use its authority under California Water Code § 13267 (or alternately by Waste Discharge Requirements and NPDES permits) to require that entities responsible for point and non-point sources of oxygen demanding substances and their precursors within the TMDL source area perform the following studies by December 2008. These studies must identify and quantify:

- (a) sources of oxygen demanding substances and their precursors in the dissolved oxygen TMDL source area
- (b) growth or degradation mechanisms of these oxygen demanding substances in transit through the source area to the DWSC
- (c) the impact of these oxygen demanding substances on dissolved oxygen concentrations in the DWSC under a range of environmental conditions and considering the effects of chemical, biological, and physical mechanisms that add or remove dissolved oxygen from the water column in the DWSC

A study plan describing how ongoing studies and future studies will address these information needs must be submitted to Regional Water Board staff by 23 October 2006. The study plan and studies may be conducted by individual responsible entities or in collaboration with other entities.

- (2) The Regional Water Board establishes the following waste load allocations:
 - (a) The waste load allocations of oxygen demanding substances and their precursors for all NPDES-permitted discharges are initially set at the corresponding effluent limitations applicable on 28 January 2005.
 - (b) Waste load allocations and permit conditions for new or expanded point source discharges in the SJR Basin upstream of the DWSC, including NPDES and stormwater, will be based on the discharger demonstrating that the discharge will have no reasonable potential to cause or contribute to a negative impact on the dissolved oxygen impairment in the DWSC.
- (3) The Regional Water Board will require any project that requires a Clean Water Act Section 401 Water Quality Certification from the Regional Water Board, and that has the

potential to impact dissolved oxygen conditions in the DWSC, to evaluate and fully mitigate those impacts. This includes, but is not limited to:

- (a) Future projects that increase the cross-sectional area of the DWSC
 - (b) Future water resources facilities projects that reduce flow through the DWSC
- (4) The Regional Water Board will require, pursuant to California Water Code § 13267, the United States Army Corps of Engineers to submit by 31 December 2006 a technical report identifying and quantifying:
- (a) the chemical, biological, and physical mechanisms by which loads of substances into, or generated within the DWSC, are converted to oxygen demand
 - (b) the impact that the Stockton Deep Water Ship Channel has on re-aeration and other mechanisms that affect dissolved oxygen concentrations in the water column
- (5) The Regional Water Board may consider alternate measures, as opposed to direct control, of certain contributing factors if these measures adequately address the impact on the dissolved oxygen impairment and do not degrade water quality in any other way.
- (6) The Regional Water Board will review allocations and implementation provisions based on the results of the oxygen demand and precursor studies and the prevailing dissolved oxygen conditions in the DWSC by December 2009.
- (7) The Regional Water Board will require compliance with waste load allocations and load allocations for oxygen demanding substances and their precursors, and development of alternate measures to address non-load related factors by 31 December 2011.
- (8) The established allocations and implementation provisions represent a maximum allowable level for the purpose of addressing the dissolved oxygen impairment in the DWSC. Where more than one allocation may be applicable, the most stringent allocation applies. The Regional Water Board may take other, more restrictive, actions affecting the contributing factors to this impairment as needed to protect other beneficial uses or to implement other water quality objectives.

4.5.10 Clear Lake Nutrients

Nuisance algae blooms impair beneficial uses in Clear Lake, which is a violation of the narrative basin plan objective that states “water shall not contain biostimulatory substances which promote aquatic growths in concentrations that cause nuisance or adversely affect beneficial uses”

Research and studies have concluded that there are likely multiple factors that influence the occurrence of nuisance algae blooms in Clear Lake. Recent improvements in water clarity may be due to a reduction in phosphorus loading or a result of other factors such as iron or sulfur availability, changes to lake ecology (introduced species, etc.), water year type or a combination of factors. For the purposes of this program of implementation both phosphorus loading and other factors that may affect algae growth will be addressed.

- (1) Modeling studies predict that a 40% reduction in average phosphorus loading will significantly reduce the incidence of algae blooms. A 40% reduction would equal an

annual allowable loading of approximately 87,100 kg. Therefore, for this program of implementation, an average annual (five year rolling average) phosphorus load of 87,100 kg is established as the loading capacity for Clear Lake.

- (2) Waste load allocations for the NPDES facilities discharging to the lake or tributaries are as follows:
 - (a) Lake County Stormwater Permittees (Lake County, City of Clearlake, City of Lakeport) - 2,000 kg phosphorus/yr
 - (b) California Department of Transportation (Caltrans) – 100 kg phosphorus/yr
- (3) The load allocation for nonpoint source dischargers is 85,000 kg/yr average annual load (five year rolling average). The U.S. Bureau of Land Management (USBLM), U.S. Forest Service (USFS), Lake County (County) and irrigated agriculture are responsible for controlling phosphorus discharges from those portions of the watershed within their respective authority.
- (4) Regional Water Board staff will work with the responsible parties – Stormwater permittees, Caltrans, USBLM, USFS, County and irrigated agriculture – to develop and implement a plan to collect the information needed to determine what factors are important in controlling nuisance blooms and to recommend what control strategy should be implemented. The responsible parties will submit the plan to the Regional Water Board by 19 June 2008. The plan should address the following topics:
 - Studies to assess the current limnological conditions and to determine the appropriate measures necessary for Clear Lake to meet the Basin Plan objectives
 - Appropriate monitoring for evaluating conditions in the lake
 - Effective collection of phosphorus loading information from the various sources
 - Practices implemented or planned to control phosphorus loading to the lake
 - Develop criteria to determine when Clear Lake is no longer impaired
- (5) Compliance with load and waste load allocations for phosphorus in Clear Lake is required by 19 June 2017. However, by 19 September 2012, the Regional Water Board will consider information developed and determine whether the phosphorus load and waste load allocations should continue to be required or if some other control strategy or approach is more appropriate. To the extent that other controllable water quality factors, besides phosphorus, cause or contribute to nuisance algae blooms, those factors will be addressed in revisions to this program of implementation. Implementation of phosphorus control practices to achieve load and waste load allocations will occur under waste discharge requirements or waivers of waste discharge requirements.
- (6) If Clear Lake is attaining its beneficial uses and the Regional Water Board determine that phosphorus loads above allocated amounts are not causing or contributing to nuisance algae problems, the Regional Water Board will amend the Basin Plan to revise this nutrient control program for Clear Lake.

4.5.11 Point Source Discharges Containing Trihalomethanes Lower New Alamo and Ulatis Creeks

Municipal wastewater that is chlorinated to remove bacteria generally forms trihalomethanes as disinfection by-products. The Policy for Implementation of Toxics Standards for Inland Waters, Enclosed Bays, and Estuaries of California (“State Implementation Plan” or “SIP”) (see the 15th Policy in State Water Board Policies and Plans, page IV-10.01) implements criteria for priority

pollutants, including trihalomethanes. However, the SIP does not address situations where water quality objectives for water bodies downstream of the first receiving water are more stringent than the water quality objectives for the first receiving water.

Old Alamo Creek is tributary to New Alamo Creek and Ulati Creek. Ulati Creek, downstream of the confluence with New Alamo Creek, is within the legal boundary of the Delta. Old Alamo Creek is not designated MUN, but New Alamo and Ulati Creeks are designated MUN. The SIP does not specifically address how to determine the need for water quality-based effluent limitations or calculate water quality-based effluent limitations in this situation, so special permitting provisions are needed for discharges of trihalomethanes to Old Alamo Creek.

With respect to the site-specific water quality objectives in [Table 3-2](#) for trihalomethanes in New Alamo Creek, from Old Alamo Creek to Ulati Creek, and Ulati Creek, from New Alamo Creek to Cache Slough, the following provisions shall apply to any point source discharges into Old Alamo Creek. For determining if water quality-based effluent limitations are necessary, Section 1.3 of the SIP does not apply. For calculation of water quality-based effluent limitations, Section 1.4 of the SIP does not apply, unless specified below.

Determination of Need for Water Quality-Based Effluent Limitations:

Step 1: For chlorodibromomethane (DBCM), dichlorobromomethane (DCBM) and chloroform, if the pollutant is not detected in the effluent and any of the reported detection limits is less than or equal to the site-specific objectives specified in [Table 3-2](#) (the site-specific objectives specified in [Table 3-2](#) will be referred to as C), then water quality-based effluent limitations are not necessary. If the pollutant is not detected in the effluent and all of the detection limits are greater than site-specific objectives (C), then proceed to Step 5. If the pollutant is detected in the effluent then proceed to Step 2.

Step 2: Determine the observed maximum ambient background concentration for DBCM, DCBM, and chloroform. The observed maximum ambient background concentrations shall be measured in New Alamo Creek at Lewis Road and is the B, as defined in section 1.4.3.1 of the SIP. If the background (B) is greater than the site-specific objectives (C), then water quality-based effluent limitations are necessary. If the background (B) is less than or equal to the site-specific objectives (C), then proceed to Step 3.

Step 3: Determine the observed maximum pollutant concentration for the effluent (MEC). If the MEC is less than or equal to the site-specific objectives (C), water quality-based effluent limitations are not necessary. If the MEC is greater than the site-specific objectives (C), then proceed to Step 4 to determine if water quality-based effluent limitations are necessary.

Step 4: If the in-stream maximum concentrations of DBCM, DCBM or chloroform at the terminus of Old Alamo Creek are greater than the site-specific objectives (C), then water quality-based effluent limitations are necessary for the constituents that exceeded the applicable objectives.

Step 5: If the pollutant has not been detected in the effluent and all detection limits are greater than the site-specific objectives (C), then the discharger shall be required to conduct twice-monthly monitoring of the effluent and of the terminus of Old Alamo Creek between 1 November and 31 March using detection limits less than or equal to the site-specific objectives (C). Steps 1-4 above will then be applied to these data to determine whether water-quality based effluent limitations are necessary.

Calculation of water quality-based effluent limitations for DBCM, DCBM, and chloroform shall be as follows:

An Attenuation Factor, which is the median of the individual sample attenuation values, is necessary because the water quality objectives do not apply in the first receiving water of the discharge (i.e., do not apply in Old Alamo Creek). If water quality-based effluent limitations are required, an attenuation factor to account for the reduction in constituent concentrations between the point of effluent discharge to Old Alamo Creek and the terminus of Old Alamo Creek shall be applied to the calculation of the Effluent Concentration Allowance (ECA), which is one of the factors used in the derivation of the effluent limitations as described in Section 1.4B of the SIP.

The ECA shall be calculated as:

$$\text{ECA} = \text{Attenuation Factor} \times [C + D(C-B)] \text{ when } C > B$$

$$\text{ECA} = \text{Attenuation Factor} \times C \quad \text{when } C \leq B$$

Where:

Attenuation Factor = the median of the individual sample attenuation values derived from all representative historical data for the 1 November through 31 March period of each year. An individual sample attenuation value is calculated as the effluent constituent concentration measured on a given day divided by the in-stream constituent concentration at the terminus of Old Alamo Creek measured the same day. It should be noted that the effluent should be sampled prior to sampling at the terminus of Old Alamo Creek.

C = the site-specific objective specified in [Table 3-2](#)

D = dilution credit, as determined in section 1.4.2 of the SIP

B = background concentration, as defined by Section 1.4.3 of the SIP, and measured in New Alamo Creek at Lewis Road

Dilution credits may be allowed in deriving water quality-based effluent limitations for DBCM, DCBM, and chloroform in accordance with Section 1.4.2 of the SIP.

The Average Monthly Effluent Limitation (AMEL) and the Maximum Daily Effluent Limitation (MDEL) shall be calculated in accordance with Section 1.4 of the SIP using the ECA calculated above.

4.6 ESTIMATED COSTS OF AGRICULTURAL WATER QUALITY CONTROL PROGRAMS AND POTENTIAL SOURCES OF FINANCING

4.6.1 San Joaquin River Subsurface Agricultural Drainage Control Program

The estimates of capital and operational costs to achieve the selenium objective for the San Joaquin River range from \$3.6 million/year to \$27.4 million/year (1990 dollars). The cost of meeting water quality objectives in Mud Slough (north), Salt Slough, and the wetland supply channels is approximately \$2.7 million /year (1990 dollars).

Potential funding sources include:

- (1) Private financing by individual sources.
- (2) Bonded indebtedness or loans from governmental institutions.
- (3) Surcharge on water deliveries to lands contributing to the drainage problem.

- (4) Ad Valorem tax on lands contributing to the drainage problem.
- (5) Taxes and fees levied by a district created for the purpose of drainage management.
- (6) State or federal grants or low-interest loan programs.
- (7) Single-purpose appropriations from federal or State legislative bodies (including land retirement programs).

4.6.2 Lower San Joaquin River Salt and Boron Control Program

The estimates of capital and operational costs to implement drainage controls needed to achieve the salt and boron water quality objectives at the Airport Way Bridge near Vernalis range from 27 to 38 million dollars per year (2003 dollars).

Potential funding sources include:

- (1) Those identified in the San Joaquin River Subsurface Agricultural Drainage Program and the Pesticide Control Program.
- (2) Annual fees for waste discharge requirements.

4.6.3 Pesticide Control Program

Based on an average of \$15 per acre per year for 500,000 acres of land planted to rice and an average of \$5 per acre per year for the remaining 3,500,000 acres of irrigated agriculture in the Sacramento and San Joaquin River Basins, the total annual cost to agriculture is estimated at \$25,000,000. Financial assistance for complying with this program may be obtainable through the U.S.D.A. Agricultural Stabilization and Conservation Service and technical assistance is available from the University of California Cooperative Extension Service and the U.S.D.A. Soil Conservation Service.

4.6.4 Sacramento and Feather Rivers Diazinon and Chlorpyrifos Runoff Control Program

The total estimated costs for management practices to meet the diazinon and chlorpyrifos objectives for the Sacramento and Feather Rivers range from \$0 to \$6.2 million/year (2007 dollars). The estimated costs for discharger monitoring, planning, and evaluation range from \$0.3 to \$1.5 million/year (2007 dollars).

Potential funding sources include:

- (1) Those identified in the San Joaquin River Subsurface Agricultural Drainage Control Program and the Pesticide Control Program.

4.6.5 San Joaquin River Dissolved Oxygen Control Program

The *Control Program for Factors Contributing to the Dissolved Oxygen Impairment in the Stockton Deep Water Ship Channel (DWSC)* requires agricultural and municipal dischargers to perform various studies. The total estimated cost of the studies to be performed as part of this control program is approximately \$15.6 million. The preferred alternative also includes a

prohibition of discharge if water quality objectives are not achieved by 31 December 2011. The estimated cost to cease discharge of water from irrigated lands ranges from \$95 to \$133 million per year. The estimated cost to provide minimum flows that would remove the need for the prohibition is approximately \$37 million dollars per year to eliminate the impairment through provision of purchased water. The cost of construction of an aeration device of adequate capacity to eliminate the impairment, in conjunction with point source load reductions already required, is estimated to be \$10 million, with yearly operation and maintenance costs of \$200,000 per year.

Potential funding sources:

- (1) Proposition 13 includes \$40 million in bond funds to address the dissolved oxygen impairment in the DWSC. Approximately \$14.4 million of this \$40 million has been identified to fund the oxygen demanding substance and precursor studies. An additional \$1.2 million is being provided from various watershed stakeholders. Approximately \$24 million of Proposition 13 funds are available to pay for projects such as the design and construction of an aeration device.
- (2) The State Water Contractors, Port of Stockton, San Luis and Delta Mendota Water Authority, San Joaquin Valley Drainage Authority, and the San Joaquin River Group Authority have proposed to develop an operating entity for an aeration device and have indicated their commitment to execute a funding agreement among themselves and other interested parties, (subject to ultimate approval of respective governing boards) that would provide the mechanism to support operation of a permanent aerator at a cost expected to be in the annual range of \$250,000 to \$400,000.

4.6.6 Diazinon and Chlorpyrifos Runoff into the San Joaquin River Control Program

The total estimated costs for management practices to meet the diazinon and chlorpyrifos objectives for the San Joaquin River range from \$56,000 to \$2.5 million for the dormant season, and from \$3.9 million to \$5.3 million for the irrigation season. The estimated costs for discharger compliance monitoring, planning and evaluation range from \$600,000 to \$3.1 million. The estimated total annual costs range from \$4.4 million to \$10.9 million (2004 dollars).

Potential funding sources include:

- (1) Those identified in the San Joaquin River Subsurface Agricultural Drainage Control Program and the Pesticide Control Program.

4.6.7 Diazinon and Chlorpyrifos Runoff into the Sacramento-San Joaquin Delta Waterways

The total estimated costs for management practices to meet the diazinon and chlorpyrifos objectives for the Delta Waterways range from \$5.9 to \$12.7 million. The estimated costs for discharger compliance monitoring, planning and evaluation range from \$600,000 to \$1.8 million. The estimated total annual costs range from \$6.5 to \$14.4 million (2005 dollars).

Potential funding sources include:

- (1) Those identified in the San Joaquin River Subsurface Agricultural Drainage Control Program and the Pesticide Control Program.

4.6.8 Clear Lake Nutrient Control Program

Estimated costs to implement best management practices, if necessary, are \$400,000 to \$1,800,000 (2006 dollars).

Potential funding sources include:

- (1) Those identified in the San Joaquin River Subsurface Agricultural Drainage Control Program and the Pesticide Control Program.

4.6.9 Delta Mercury Control Program

The total estimated costs (2007 dollars) for the agricultural methylmercury control studies to develop management practices to meet the Delta methylmercury allocations range from \$290,000 to \$1.4 million. The estimated annual costs for agricultural discharger compliance monitoring range from \$14,000 to \$25,000. The estimated annual costs for Phase 2 implementation of methylmercury management practices range from \$590,000 to \$1.3 million.

- (1) Potential funding sources include those identified in the San Joaquin River Subsurface Agricultural Drainage Control Program and the Pesticide Control Program.

4.6.10 Long-Term Irrigated Lands Regulatory Program

The Central Valley Water Board intends on establishing a long-term irrigated lands regulatory program (Long-Term Program) by adopting one or more general waste discharge requirements and/or conditional waivers of WDRs to regulate the discharge of waste to ground and surface waters from irrigated agricultural operations. The Long-Term Program will be based, in whole or in part, on six alternatives described in the *Irrigated Lands Regulatory Program Final Environmental Impact Report* (Final PEIR; ICF International 2011) certified by resolution R5-2011-0017. The cost estimate below is based upon and encompasses the full range of those alternatives.

The cost estimate for the Long-Term Program accounts for program administration (e.g., Board oversight and third-party activities), monitoring for groundwater and surface water quality, and implementation of management practices throughout the Central Valley. The estimated cost for the annual capital and operational costs to comply with the Long-Term Program range from \$216 million to \$1,321 million (2007 dollars). This cost estimate is a cumulative total that includes costs from the Sacramento River and San Joaquin River Basins, and the Tulare Lake Basin.

Potential funding sources include:

- (1) The Federal Farm Bill, which authorizes funding for conservation programs such as the Environmental Quality Incentives Program (EQIP) and the Conservation Stewardship Program.
- (2) Grant and loan programs administered by the State Water Resources Control Board and Department of Water Resources, which are targeted for agricultural drainage management, water use efficiency, and water quality improvement. These programs include:
 - (a) Agricultural Drainage Management Program (State Water Resources Control Board)

- (b) Agricultural Drainage Loan Program (State Water Resources Control Board)
 - (c) Clean Water Act funds (State Water Resources Control Board)
 - (d) Agricultural Water Quality Grant Program (State Water Resources Control Board)
 - (e) Clean Water State Revolving Fund (State Water Resources Control Board)
 - (f) Integrated Regional Water Management grants (State Water Resources Control Board, Department of Water Resources)
- (3) Those identified in the San Joaquin River Subsurface Agricultural Drainage Control Program.

4.6.11 Drinking Water Policy

The total estimated costs to implement management practices, if necessary, range from zero to approximately \$6.8 million (2013 dollars).

Potential funding sources include:

- (1) Those identified in the San Joaquin River Subsurface Agricultural Drainage Control Program and Pesticide Control Program.

4.6.12 Diazinon and Chlorpyrifos Discharges

The costs estimated in this section were calculated in consideration of the requirements for diazinon and chlorpyrifos discharges only. Most of these compliance costs likely already exist due to other Board Requirements under the Irrigated Lands Regulatory Program, and the requirements for diazinon and chlorpyrifos in the Sacramento and Feather Rivers, the San Joaquin River Basin, and the Sacramento-San Joaquin Delta.

The total estimated costs for management practices to meet the diazinon and chlorpyrifos objectives in the Sacramento and San Joaquin River Basins range from \$5 to \$21.6 million/year (2010 dollars). The estimated costs for agricultural discharger compliance monitoring, planning, and evaluation range from \$1.6 to \$6.0 million/year (2010 dollars). The estimated annual costs range from \$6.6 to \$27.6 million (2010 dollars).

Potential funding sources include:

- (1) Those identified in the San Joaquin River Subsurface Agricultural Drainage Control Program and Pesticide Control Program.

5 SURVEILLANCE AND MONITORING

This chapter describes the methods and programs that the Regional Water Board uses to acquire water quality information. Acquisition of data is a basic need of a water quality control program and is required by both the Clean Water Act and the Porter-Cologne Water Quality Control Act.

The Regional Water Board's surveillance and monitoring efforts include different types of sample collection and analysis. Surface water surveillance may involve analyses of water, sediment, or tissue samples and ground water surveillance often includes collection and analysis of soil samples. Soil, water, and sediment samples are analyzed via standard, EPA approved, laboratory methods. The Regional Water Board addresses quality assurance through bid specifications and individual sampling actions such as submittal of split, duplicate, or spiked samples and lab inspections.

Although surveillance and monitoring efforts have traditionally relied upon measurement of key chemical/physical parameters (e.g., metals, organic and inorganic compounds, bacteria, temperature, and dissolved oxygen) as indicators of water quality, there is increasing recognition that close approximation of water quality impacts requires the use of biological indicators. This is particularly true for regulation of toxic compounds in surface waters where standard physical/chemical measurement may be inadequate to indicate the wide range of substances and circumstances able to cause toxicity to aquatic organisms. The use of biological indicators to identify or measure toxic discharges is often referred to as biotoxicity testing. EPA has issued guidelines and technical support materials for biotoxicity testing. A key use of the method is to monitor for compliance with narrative water quality objectives or permit requirements that specify that there is to be no discharge of toxic materials in toxic amounts. The Regional Water Board will continue to use biotoxicity procedures and testing in its surveillance and monitoring program.

As discussed previously, the protection, attainment, and maintenance of beneficial uses occur as part of a continuing cycle of identifying beneficial use impairments, applying control measures, and assessing program effectiveness. The Regional Water Board surveillance and monitoring program provides for the collection, analysis, and distribution of the water quality data needed to sustain its control program. Under ideal circumstances, the Regional Water Board surveillance and monitoring program would produce information on the frequency, duration, source, extent, and severity of beneficial use impairments. In attempting to meet this goal, the Regional Water Board relies upon a variety of measures to obtain information. The current surveillance and monitoring program consists primarily of seven elements:

5.1 DATA COLLECTED BY OTHER AGENCIES

The Regional Water Board currently relies on internal staff coordination and compilation of data collected by a variety of other agencies to augment data collected by internal programs in order to assess ambient water quality conditions and program effectiveness. For example, the Department of Water Resources (DWR) has an ongoing monitoring program in the Delta and the United States Geological Survey (USGS) and DWR conduct monitoring in some upstream rivers. The Department of Fish and Wildlife, Fish and Wildlife Service, USGS, and State Water Board Division of Drinking Water Programs also conduct special studies and collect data, as do local entities such as water purveyors, county health departments and wastewater treatment plants.

The long-term goal is to have a system in place that facilitates consolidation of information gathered from all agencies in a format that can be readily utilized to provide the foundation for regular assessments of ambient surface water quality conditions and program effectiveness including support of updates to the California Integrated Report (Clean Water Act Sections 303(d)/305(b)) which provides a water quality conditions assessment of surface water bodies.

5.2 REGIONAL WATER BOARD AND STATE WATER BOARD MONITORING PROGRAMS

The State Water Board manages its own Toxic Substances Monitoring (TSM) program to collect and analyze fish tissue for the presence of bioaccumulative chemicals. The Regional Water Board participates in the selection of sampling sites for its basins and annually is provided with a report of the testing results.

5.3 SPECIAL STUDIES

Intensive water quality studies provide detailed data to locate and evaluate violations of receiving water standards and to make waste load allocations. They usually involve localized, frequent and/or continuous sampling. These studies are specially designed to evaluate problems in potential water quality limited segments, areas of special biological significance or hydrologic units requiring sampling in addition to the routine collection efforts.

One such study is the *San Joaquin River Subsurface Agricultural Drainage Monitoring Program*. The program includes the following tasks:

- (1) The dischargers will monitor discharge points and receiving waters for constituents of concern and flow (discharge points and receiving water points)
- (2) The Regional Board will inspect discharge flow monitoring facilities and will continue its cooperative effort with dischargers to ensure the quality of laboratory results.
- (3) The Regional Board will, on a regular basis, inspect any facilities constructed to store or treat agricultural subsurface drainage.
- (4) The Regional Board will continue to maintain and update its information on agricultural subsurface drainage facilities in the Grassland watershed. Efforts at collecting basic data on all facilities, including flow estimates and water quality will continue.
- (5) The Regional Water Board, in cooperation with other agencies, will regularly assess water conservation achievements, cost of such efforts and drainage reduction effectiveness information. In addition, in cooperation with the programs of other agencies and local district managers, the Regional Board will gather information on irrigation practices, i.e., irrigation efficiency, pre-irrigation efficiency, excessive deep percolation and on seepage losses.

Another such study is a surveillance and monitoring program conducted by the El Dorado Irrigation District (EID) on Deer Creek in El Dorado and Sacramento Counties. Regional Board staff will work with EID to ensure adequate temperature, flow and biological monitoring is conducted to evaluate compliance with the site-specific temperature objectives for Deer Creek and their effect on beneficial uses.

5.4 AERIAL SURVEILLANCE

Low-altitude flights are conducted primarily to observe variations in field conditions, gather photographic records of discharges, and document variations in water quality.

5.5 SELF-MONITORING

Self-monitoring reports are normally submitted by the discharger on a monthly or quarterly basis as required by the permit conditions. They are routinely reviewed by Regional Water Board staff.

For point source discharges to Old Alamo Creek that contain detectable concentrations of chlorodibromomethane (DBCM), dichlorobromomethane (DCBM) or chloroform, the discharger's monitoring and reporting program shall include coordinated monitoring of the effluent and Old Alamo Creek at its terminus, immediately prior to Old Alamo Creek's discharge into New Alamo Creek, for DBCM, DCBM or chloroform. It should be noted that the effluent should be sampled prior to sampling at the terminus of Old Alamo Creek. At a minimum, the discharger shall conduct the coordinated monitoring twice-monthly from 1 November through 31 March once during the 5-year term of the NPDES permit.

5.6 COMPLIANCE MONITORING

Compliance monitoring determines permit compliance, validates self-monitoring reports, and provides support for enforcement actions. Discharger compliance monitoring and enforcement actions are the responsibility of the Regional Water Board staff.

5.7 COMPLAINT INVESTIGATION

Complaints from the public or governmental agencies regarding the discharge of pollutants or creation of nuisance conditions are investigated and pertinent information collected.

5.8 MERCURY AND METHYLMERCURY

The Regional Water Board will use the following criteria to determine compliance with the methylmercury fish tissue objectives. Site-specific criteria for various water bodies are described below.

The number of fish collected to determine compliance with the methylmercury objective will be based on the statistical variance within each species. The sample size will be determined by methods described in USEPA's Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories (Third Edition, 2000) or other statistical methods approved by the Executive Officer.

Analysis of fish tissue for total mercury is acceptable for assessing compliance. Compliance with the fish tissue objective is achieved when the average concentrations in local fish are equivalent to the respective objective for three consecutive years.

5.8.1 Clear Lake

Fish from the following species will be collected and analyzed every ten years. The representative fish species for trophic level 4 shall be largemouth bass (total length 300-400 mm), catfish (total length 300 – 400 mm), brown bullhead (total length 300-400 mm), and crappie (total length 200-300 mm). The representative fish species for trophic level 3 shall be carp, hitch, Sacramento blackfish, black bullhead, and bluegill of all sizes; and brown bullhead and catfish of lengths less than the trophic level 4 lengths.

Fish tissue mercury concentrations are not expected to respond quickly to remediation activities at Sulphur Bank Mercury Mine, Clear Lake sediments, or the tributaries. Adult fish integrate methylmercury over a lifetime and load reduction efforts are not expected to be discernable for more than five years after remediation efforts. To assess remedial activities, part of the monitoring at Clear Lake will include indicator species, consisting of inland silversides and largemouth bass less than one year old, to be sampled every five years. Juveniles of these species will reflect recent exposure to methylmercury and can be indicators of mercury reduction efforts. Average concentrations of methylmercury by trophic level should be determined in a combination of the identified species collected throughout Clear Lake.

Total mercury in tributary sediment, lake sediment, and water will be monitored to determine whether loads have decreased. The water and sediment monitoring frequency will be every five years.

5.8.2 Cache Creek, Bear Creek, Harley Gulch, and Sulphur Creek

The Regional Water Board will use the following criteria to determine compliance with the methylmercury fish tissue objectives in Cache and Bear Creeks. Compliance with the respective objectives shall be determined based on fish tissue analysis in Cache Creek from Clear Lake to the Settling Basin, North Fork Cache Creek, and Bear Creek upstream and downstream of Sulphur Creek.

The representative fish species for each trophic level shall be:

- Trophic Level 3: green sunfish, bluegill, and/or Sacramento sucker (rainbow trout also an option for North Fork Cache Creek);
- Trophic Level 4: Sacramento pikeminnow, largemouth bass, smallmouth bass and/or channel catfish.

The sample sets will include at least two species from each trophic level (i.e., bass and Sacramento pikeminnow, for TL4) collected at each compliance point or stream section. The samples will include a range of sizes of fish between 250 and 350 mm, total length, with average length of 300 mm. If green sunfish and bluegill are not available in this size range; those sampled should be greater than 125 mm total length. If two species per trophic level are not available and are unlikely to be present given historical sampling information, one species is acceptable (the only TL4 species typically in North Fork is Sacramento pikeminnow).

Compliance with the Harley Gulch methylmercury water quality objective will be determined using hardhead, California roach, or other small (TL2/3), resident species in the size range of 75-100 mm total length.

Aqueous methylmercury goals are in the form of the annual, average concentration in unfiltered samples. For comparison of methylmercury concentration data with aqueous methylmercury goals, water samples are recommended to be collected periodically throughout the year and during typical flow conditions as they vary by season, rather than targeting extreme low or high flow events. Aqueous methylmercury data may be collected by Regional Water Board staff or required of project proponents.

Monitoring for mine cleanups or other projects that are expected to significantly affect methylmercury or mercury loads are recommended to include the following parameters. The data may be collected by Regional Water Board staff or required of project proponents.

- Monitoring parameters for soil and sediment: concentration of total mercury in soil or sediment in the silt/clay (<63 microns) fraction.
- Monitoring parameters for water: methylmercury (if project is methylmercury source), total mercury, total suspended solids, turbidity, and stream flow. Water sampling in major tributaries is recommended to include high flow events for mercury and total suspended solids. More frequent monitoring (two to four significant storm events for three consecutive years) is recommended after cleanup to evaluate the effectiveness of cleanup actions.
- Monitoring of mercury in suspended sediment: The ratio of concentrations of mercury in suspended sediment (Hg/TSS) is a useful measure of mercury contamination. Effectiveness of cleanup of the mines may be assessed by comparing concentration of mercury in fine-grained sediment discharging from the mines to the average concentration in background (not affected by mining activities) soil or sediment.

5.8.3 Delta

5.8.3.1 Fish Methylmercury Compliance Monitoring

The Regional Water Board will use the following specifications to determine compliance with the methylmercury fish tissue objectives in the Sacramento-San Joaquin Delta. Beginning 2025, Regional Water Board staff will initiate fish tissue monitoring. Thereafter compliance monitoring will ensue every ten years, more frequently as needed where substantial changes in methyl or total mercury concentrations or loading occur, but not to exceed ten years elsewhere.

Initial fish tissue monitoring will take place at the following compliance reaches in each subarea:

- Central Delta subarea: Middle River between Bullfrog Landing and Mildred Island;
- Marsh Creek subarea: Marsh Creek from Highway 4 to Cypress Road;
- Mokelumne/Cosumnes River subarea: Mokelumne River from the Interstate 5 bridge to New Hope Landing;
- Sacramento River subarea: Sacramento River from River Mile 40 to River Mile 44;
- San Joaquin River subarea: San Joaquin River from Vernalis to the Highway 120 bridge;
- West Delta subarea: Sacramento/San Joaquin River confluence near Sherman Island;
- Yolo Bypass-North subarea: Tule Canal downstream of its confluence with Cache Creek; and
- Yolo Bypass-South subarea: Toe Drain between Lisbon and Little Holland Tract.

Compliance fish methylmercury monitoring will include representative fish species for comparison to each of the methylmercury fish tissue objectives:

- Trophic Level 4: bass (largemouth and striped), channel and white catfish, crappie, and Sacramento pikeminnow.

- Trophic Level 3: American shad, black bullhead, bluegill, carp, Chinook salmon, redear sunfish, Sacramento blackfish, Sacramento sucker, and white sturgeon.
- Small (<50 mm) fish: primary prey species consumed by wildlife in the Delta, which may include the species listed above, as well as inland silverside, juvenile bluegill, mosquitofish, red shiner, threadfin shad, or other fish less than 50 mm.

Trophic level 3 and 4 fish sample sets will include three species from each trophic level and will include both anadromous and non-anadromous fish. Trophic level 3 and 4 fish sample sets will include a range of fish sizes between 150 and 500 mm total length. Striped bass, largemouth bass, and sturgeon caught for mercury analysis will be within the CDFW legal catch size limits. Sample sets for fish less than 50 mm will include at least two fish species that are the primary prey species consumed by wildlife at sensitive life stages. In any subarea, if multiple species for a particular trophic level are not available, one species in the sample set is acceptable.

5.8.3.2 Water Methylmercury and Total Mercury Compliance Monitoring

Compliance points for irrigated agriculture and managed wetlands methylmercury allocations shall be developed during the Phase 1 Control Studies.

In conjunction with the Phase 1 Control Studies, nonpoint sources, irrigated agriculture, and managed wetlands shall develop and implement mercury and/or methylmercury monitoring, and submit monitoring reports.

NPDES facilities' compliance points for methylmercury and total mercury monitoring are the effluent monitoring points currently described in individual NPDES permits.

During Phase 1 and Phase 2, facilities listed in [Table 4-16](#) shall conduct effluent total mercury and methylmercury monitoring starting by 20 October 2012. Monitoring frequencies shall be defined in the NPDES permits. Effluent monitoring requirements will be re-evaluated during the Delta Mercury Control Program Reviews.

Facilities that begin discharging to surface water during Phase 1 and facilities for which effluent methylmercury data were not available at the time [Table 4-16](#) was compiled, shall conduct monitoring.

Compliance points and monitoring frequencies for MS4s required to conduct methylmercury and total mercury monitoring are those locations and wet and dry weather sampling periods currently described in the individual MS4 NPDES permits or otherwise determined to be representative of the MS4 service areas and approved by the Executive Officer on an MS4-specific basis.

Annual methylmercury loads in urban runoff in MS4 service areas within the Delta and Yolo Bypass may be calculated by the following method or by an alternate method approved by the Executive Officer. The annual methylmercury load in urban runoff for a given MS4 service area during a given year may be calculated by the sum of wet weather and dry weather methylmercury loads. To estimate wet weather methylmercury loads discharged by MS4 urban areas, the average of wet weather methylmercury concentrations observed at the MS4's compliance locations may be multiplied by the wet weather runoff volume estimated for all urban areas within the MS4 service area within the Delta and Yolo Bypass. To estimate dry weather methylmercury loads, the average of dry weather methylmercury concentrations observed at the MS4's compliance locations may be multiplied by the estimated dry weather urban runoff volume in the MS4 service area within the Delta and Yolo Bypass.

5.9 DIAZINON AND CHLORPYRIFOS RUNOFF INTO THE SACRAMENTO AND FEATHER RIVERS

The Regional Water Board requires a focused monitoring effort of agricultural pesticide runoff into the Sacramento and Feather Rivers.

The monitoring and reporting program for any waste discharge requirements or waiver of waste discharge requirements that addresses agricultural pesticide runoff into the Sacramento and Feather Rivers must be designed to collect the information necessary to:

- (1) determine compliance with established water quality objectives and the loading capacity applicable to diazinon and chlorpyrifos in the Sacramento and Feather Rivers;
- (2) determine compliance with load allocations for diazinon and chlorpyrifos;
- (3) determine the degree of implementation of management practices to reduce off-site migration of diazinon and chlorpyrifos;
- (4) determine the effectiveness of management practices and strategies to reduce off-site migration of diazinon and chlorpyrifos;
- (5) determine whether alternatives to diazinon or chlorpyrifos are causing surface water quality impacts;
- (6) determine whether the discharge causes or contributes to a toxicity impairment due to additive or synergistic effects of multiple pollutants; and
- (7) demonstrate that management practices are achieving the lowest pesticide levels technically and economically achievable.

Dischargers are responsible for providing the necessary information. The information may come from the dischargers' monitoring efforts; monitoring programs conducted by State or federal agencies or collaborative watershed efforts; or from special studies that evaluate the effectiveness of management practices.

5.10 DIAZINON AND CHLORPYRIFOS RUNOFF IN THE SAN JOAQUIN RIVER BASIN

The Regional Water Board requires a focused monitoring effort of pesticide runoff from orchards and fields in the San Joaquin Valley.

The monitoring and reporting program for any waste discharge requirements or waiver of waste discharge requirements that addresses pesticide runoff from orchards and fields in the San Joaquin valley must be designed to collect the information necessary to:

- (1) determine compliance with established water quality objectives and the loading capacity applicable to diazinon and chlorpyrifos in the San Joaquin River;
- (2) determine compliance with established load allocations for diazinon and chlorpyrifos;

- (3) determine the degree of implementation of management practices to reduce off-site movement of diazinon and chlorpyrifos;
- (4) determine the effectiveness of management practices and strategies to reduce off-site migration of diazinon and chlorpyrifos;
- (5) determine whether alternatives to diazinon and chlorpyrifos are causing surface water quality impacts;
- (6) determine whether the discharge causes or contributes to a toxicity impairment due to additive or synergistic effects of multiple pollutants; and
- (7) demonstrate that management practices are achieving the lowest pesticide levels technically and economically achievable.

Dischargers are responsible for providing the necessary information. The information may come from the dischargers' monitoring efforts; monitoring programs conducted by State or federal agencies or collaborative watershed efforts; or from special studies that evaluate the effectiveness of management practices.

5.11 DIAZINON AND CHLORPYRIFOS RUNOFF INTO THE SACRAMENTO-SAN JOAQUIN DELTA WATERWAYS

The Regional Water Board requires a focused monitoring effort of pesticide runoff from orchards and fields discharging to the Sacramento-San Joaquin Delta Waterways (as identified in Appendix 42).

The monitoring and reporting program for any waste discharge requirements or waiver of waste discharge requirements that addresses pesticide runoff into the Delta Waterways must be designed to collect the information necessary to:

- (1) Determine compliance with established water quality objectives and loading capacity, applicable to diazinon and chlorpyrifos in the Delta Waterways.
- (2) Determine compliance with the load allocations applicable to discharges of diazinon and chlorpyrifos into the Delta Waterways.
- (3) Determine the degree of implementation of management practices to reduce off-site movement of diazinon and chlorpyrifos.
- (4) Determine the effectiveness of management practices and strategies to reduce off-site migration of diazinon and chlorpyrifos.
- (5) Determine whether alternatives to diazinon and chlorpyrifos are causing surface water quality impacts.
- (6) Determine whether the discharge causes or contributes to a toxicity impairment due to additive or synergistic effects of multiple pollutants.
- (7) Demonstrate that management practices are achieving the lowest pesticide levels technically and economically achievable.

Dischargers are responsible for providing the necessary information. The information may come from the dischargers' monitoring efforts; monitoring programs conducted by State or federal agencies or collaborative watershed efforts; or from special studies that evaluate the effectiveness of management practices.

With Regional Water Board Executive Officer approval, monitoring can be performed in a subset of the Delta Waterways listed in Appendix 42, and the tributaries of those waterways, to determine compliance with the water quality objectives, loading capacity and load allocations.

5.12 CLEAR LAKE NUTRIENTS

The responsible parties – Lake County, City of Clearlake, City of Lakeport, Caltrans, USBLM, USFS and irrigated agriculture – will work with Regional Water Board staff to estimate nutrient loadings from activities in the watershed. Loading estimates can be conducted using either water quality monitoring or computer modeling or a combination of the two.

5.13 DRINKING WATER POLICY

Monitoring and surveillance for the Drinking Water Policy consists of two elements.

5.13.1 *Cryptosporidium* and *Giardia* Monitoring

It is not the intent of the Drinking Water Policy to require routine effluent monitoring for *Cryptosporidium* and *Giardia*. Rather, the Regional Water Board should work with interested stakeholders to gather data that could be used to help identify potential sources if *Cryptosporidium* levels increase to the trigger level (in Chapter 4) at an existing public water system intake in the future. This one-time *Cryptosporidium* special study could be conducted through the Delta Regional Monitoring Program or through another coordinated effort between dischargers, drinking water suppliers, and state agencies. The study will characterize ambient background conditions and potential sources to be used when and if exceedance of a trigger occurs. The study is envisioned to last two years targeting the period of Long Term 2 Enhanced Surface Water Treatment Rule second round monitoring. The study may consist of the following elements:

- Literature review to identify available source information
- Continued monitoring at existing public water systems intakes
- Monitoring at several ambient locations that will be identified as sites that integrate the pathogen sources where historic pathogen data are unavailable
- Monitoring at several representative discharge locations, if representative pathogen concentrations are not available or if coordinated data are necessary
- Hydrodynamic and particle tracking models to simulate the transport of pathogens from potential sources to public water system intakes
- If needed, focused studies to identify the viability and fate and transport of *Cryptosporidium*.

A report documenting the results of the special study should be prepared.

5.13.2 Organic carbon, salinity, and nutrients

As waste discharge requirements are renewed, the Regional Water Board should consider the necessity for inclusion of monitoring of organic carbon, salinity, and nutrients. This consideration should include a combination of the following:

- (1) The location with respect to drinking water intakes.
- (2) The importance of the load based on available information.
- (3) Whether the information exists that the load has significantly increased.
- (4) Importance of data to management decisions to protect drinking water.

For general permits, agriculture and small dischargers (smaller than 5 mgd), careful consideration should be made as to whether monitoring for these constituents is necessary.

Where water quality monitoring is performed to evaluate management practices to control other constituents, the Regional Water Board recommends monitoring of organic carbon, salinity, and nutrients be considered to evaluate the influence on drinking water quality.

5.14 DIAZINON AND CHLORPYRIFOS DISCHARGES

The Central Valley Water Board will ensure that there will be a focused monitoring effort to monitor pesticide discharges in the Sacramento and San Joaquin River Basins.

The Board will require those that discharge diazinon and chlorpyrifos to provide information to the Board. This information may come from the dischargers' monitoring efforts; monitoring programs conducted by state or federal agencies or collaborative watershed efforts; or from special studies that evaluate the effectiveness of management practices. To be used in determining compliance with the water quality objectives, diazinon and chlorpyrifos concentration data must be from analysis with limits of quantification (reporting limits) at or below the water quality objective concentrations.

5.14.1 Agricultural Discharge Monitoring

The monitoring and reporting program for any waste discharge requirements or waiver of waste discharge requirements that address agricultural pesticide discharges to [Table 3-4](#) Applicable Water Bodies must be designed to collect the information necessary to:

- (1) Determine compliance with established water quality objectives applicable to diazinon and/or chlorpyrifos;
- (2) Determine the extent of implementation of management practices to reduce off-site migration of diazinon and/or chlorpyrifos;
- (3) Determine the effectiveness of management practices and strategies to reduce off-site migration of diazinon and/or chlorpyrifos;
- (4) Determine whether alternatives to diazinon and/or chlorpyrifos are being discharged at concentrations which have the potential to cause or contribute to exceedances of applicable water quality objectives; and

- (5) Determine whether the discharge causes or contributes to a toxicity impairment due to additive or synergistic effects of multiple pollutants.

Representative monitoring may be used to determine compliance with the water quality objectives. Monitoring shall be representative of all [Table 3-4](#) Applicable Water Bodies, either directly or through a representative monitoring program. Changes in monitoring requirements may be required if pesticide use data, management practices, runoff potential, or other information indicates additional or less monitoring, including discontinuation of monitoring for diazinon and/or chlorpyrifos is needed to meet the monitoring requirements.

5.14.2 Municipal Storm Water and Municipal and Domestic Wastewater Monitoring

The monitoring and reporting program for any waste discharge requirements that address discharges to [Table 3-4](#) Applicable Water Bodies from

- municipal storm water
- municipal or domestic wastewater, or
- other non-agricultural sites where diazinon or chlorpyrifos are applied,

must be designed to collect the information necessary to:

- (1) Determine whether the discharge causes or contributes to an exceedance of water quality objectives for diazinon and/or chlorpyrifos;
- (2) Determine whether alternatives to diazinon and/or chlorpyrifos are being discharged at concentrations with the potential to cause or contribute to exceedances of water quality objectives. In determining if monitoring for alternatives to diazinon and/or chlorpyrifos is necessary, and to identify alternatives for which monitoring might be appropriate, the Board will consult and coordinate with DPR and will consider the commercial availability of analytical methods.

With Executive Officer approval, representative monitoring programs, including coordinated regional monitoring programs, may be used to meet the monitoring requirements listed above. Regular monitoring for diazinon and chlorpyrifos and alternatives to diazinon and chlorpyrifos can be discontinued upon a showing by a discharger that such pesticides are not found in the effluent at concentrations with the potential to cause or contribute to exceedances of water quality objectives

6 GLOSSARY

Regional Water Board: California Regional Water Quality Control Board, Central Valley Region
(Wat. Code, § 13203)

State Water Board: State Water Resources Control Board

A P P E N D I X

APPENDIX DIRECTORY

<u>ITEM*</u>	<u>DESCRIPTION</u>
1.	State Water Board Policy for Water Quality Control
2.	State Water Board Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality of Waters in California
3.	State Water Board Resolution No. 74-43, Water Quality Control Policy for the Enclosed Bays and Estuaries of California
4.	State Water Board Resolution No. 75-58, Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Powerplant Cooling
5.	State Water Board Resolution No. 77-1, Policy with Respect to Water Reclamation in California
6.	State Water Board Resolution No. 87-22, Policy on the Disposal of Shredder Waste
7.	State Water Board Resolution No. 88-23, Policy Regarding the Underground Storage Tank Pilot Program
8.	State Water Board Resolution No. 88-63, Sources of Drinking Water Policy
9.	State Water Board Resolution No. 92-49, Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304
10.	State Water Board Resolution No. 93-62, Policy for Regulation of Discharges of Municipal Solid Waste
11.	State Water Board Water Quality Control Plan for Temperature in Coastal and Inerstate Waters and Enclosed Bays and Estuaries in California (Thermal Plan)
12.	State Water Board Resolution No. 92-82, exception to the Thermal Plan for Sacramento Regional County Sanitation District
13.	State Water Board MAA with Forest Service, U. S. Department of Agriculture
14.	State Water Board MOA with Department of Health Services (later renamed the Department of Public Health) (implementation of hazardous waste program)
15.	State Water Board MOA with Department of Health Services (later renamed State Water Board Division of Drinking Water Programs) (use of reclaimed water)
16.	State Water Board MAA with the Board of Forestry and California Department of Forestry and Fire Protection

* Appendix items are paginated by: item number/item page/item total pages

APPENDIX DIRECTORY

<u>ITEM*</u>	<u>DESCRIPTION</u>
17.	State Water Board MOA with CA Department of Conservation, Division of Oil and Gas
18.	State Water Board MOU with Department of Health Services/Department of Toxic Substances Control (later the Department of Health Services was renamed the Department of Public Health and the Toxic Substances Control Program was reorganized into the Department of Toxic Substances Control)
19.	State Water Board MOU with Soil Conservation Service, U.S. Department of Agriculture for Planning and Technical Assistance Related to Water Quality Policies and Activities
20.	State Water Board MOU with the Environmental Affairs Agency, Air Resources Board, and California Integrated Waste Management Board
21.	State Water Board MOU with the California Department of Pesticide Regulation for the Protection of Water Quality from Potentially Adverse Effects of Pesticides
22.	State Water Board MOU with Several Agencies Regarding the Implementation of the San Joaquin Valley Drainage Program's Recommended Plan
23.	State Water Board MOU with the California Integrated Waste Management Board
24.	State Water Board MOU with the Bureau of Land Management US Department of Interior - Nonpoint Source Issues, Planning and Coordination of Nonpoint Source Water Quality Policies and Activities
25.	Regional Water Board Resolution No. 70-118, Delegation of Certain Duties and Powers of the Regional Water Board to the Board's Executive Officer
26.	Regional Water Board MOU with U.S. Bureau of Land Management (Ukiah District)
27.	Regional Water Board MOU with U.S. Bureau of Land Management (Susanville District)
28.	Regional Water Board MOU with U.S. Bureau of Land Management (Bakersfield District)
29.	Regional Water Board MOA with U. S. Bureau of Reclamation
30.	Regional Water Board MOU with California Dept. of Fish and Game (later renamed the California Dept. of Fish and Wildlife) and Mosquito Abatement and Vector Control Districts of the South San Joaquin Valley Regarding Vegetation Management in Wastewater Treatment Facilities

* Appendix items are paginated by: item number/item page/item total pages

APPENDIX DIRECTORY

<u>ITEM*</u>	<u>DESCRIPTION</u>
31.	Regional Water Board Resolution No. 89-247, Conditional Waiver of Waste Discharge Requirements at Retail Fertilizer Facilities - - - Removed 13 August 2009
32.	Regional Water Board Resolution No. 90-34, Conditional Waiver of Waste Discharge Requirements at Pesticide Applicator Facilities - - - Removed 13 August 2009
33.	Regional Water Board Guidelines for Winery Waste
34.	Regional Water Board Guidelines for Erosion
35.	Regional Water Board Guidelines for Small Hydroelectric Facilities
36.	Regional Water Board Guidelines for Disposal from Land Developments - - - Removed 27 March 2014
37.	Regional Water Board Guidelines for Mining
38.	Regional Water Board list of Water Quality Limited Segments - - - Removed 6 September 2002
39.	Federal Anti-degradation policy (40 CFR 131.12)
40.	Grassland Watershed Wetland Channels
41.	San Joaquin Area Subarea Descriptions
42.	Sacramento-San Joaquin Delta Waterways
43.	Delta and Yolo Bypass Waterways Applicable to the Delta Mercury Control Program
44.	Water Bodies That Meet One or More of the Sources of Drinking Water Policy (Resolution 88-63) Exceptions

* Appendix items are paginated by: item number/item page/item total pages

EXHIBIT “10”

STATE WATER RESOURCES CONTROL BOARD
CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

**Part 3 of the Water Quality Control Plan
for Inland Surface Waters, Enclosed Bays, and
Estuaries of California**

—

**Bacteria Provisions and a
Water Quality Standards Variance Policy**

February 4, 2019



[The following text is to be added to Chapter II, Chapter III, Chapter IV, and the Glossary of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California.]

II. BENEFICIAL USES

The Regional Water Quality Control Boards (Regional Water Boards) shall use the following beneficial use and abbreviation listed below to the extent such activities are defined in a water quality control plan after February 4, 2019:

Limited Water Contact Recreation (LREC-1): Uses of water that support limited recreational activities involving body contact with water, where the activities are predominantly limited by physical conditions and, as a result, body contact with water and ingestion of water is infrequent or insignificant.

III. WATER QUALITY OBJECTIVES

E. Bacteria

1. Applicability

Chapter III.E.2 establishes water quality objectives for reasonable protection of people that recreate within all surface waters, enclosed bays, and estuaries of the state that have the water contact recreation beneficial use (REC-1).¹

2. Bacteria Water Quality Objectives

Chapter III.E.2 contains two BACTERIA WATER QUALITY OBJECTIVES² applicable to waters with the REC-1 beneficial use, depending on the salinity level, as discussed below (see Table 1).

¹ As of February 4, 2019, the effective date of Part 3 of the ISWEBE, the BASIN PLAN (p. 3-4) for the Lahontan Regional Water Board contains fecal coliform bacteria water quality objectives that are generally applicable to all surface waters within the region and not expressly established for the reasonable protection of the REC-1 beneficial use. Part 3 of the ISWEBE establishes numeric bacteria water quality objectives for the REC-1 beneficial use and, therefore, would apply to applicable waters within the Lahontan region that have the REC-1 beneficial use and do not supersede the fecal coliform bacteria objectives.

² Terms in “ALL CAPS” font (except abbreviations) are defined in the Glossary, Attachment A.

E. coli

The bacteria water quality objective for all waters where the salinity is equal to or less than 1 part per thousand (ppth) 95 percent or more of the time during the CALENDAR YEAR is: a six-week rolling GEOMETRIC MEAN of *Escherichia coli* (*E. coli*) not to exceed 100 colony forming units (cfu) per 100 milliliters (mL), calculated weekly, and a STATISTICAL THRESHOLD VALUE (STV) of 320 cfu/100 mL not to be exceeded by more than 10 percent of the samples collected in a CALENDAR MONTH, calculated in a static manner.

United States Environmental Protection Agency (U.S. EPA) recommends using U.S. EPA Method 1603 or other equivalent method to measure culturable *E. coli*.

Enterococci

The bacteria water quality objective for all waters where the salinity is greater than 1 ppth more than 5 percent of the time during the CALENDAR YEAR is: a six-week rolling GEOMETRIC MEAN of enterococci not to exceed 30 cfu/100 mL, calculated weekly, with a STV of 110 cfu/100 mL not to be exceeded by more than 10 percent of the samples collected in a CALENDAR MONTH, calculated in a static manner.

U.S. EPA recommends using U.S. EPA Method 1600 or other equivalent method to measure culturable enterococci.

Table 1. REC-1 Bacteria Water Quality Objectives

Applicable Waters	Objective Elements	Estimated Illness Rate (NGI): 32 per 1,000 water contact recreators	
		Magnitude	
	Indicator	GM (cfu/100 mL)	STV (cfu/100 mL)
All waters where the salinity is equal to or less than 1 ppth 95 percent or more of the time	<i>E. coli</i>	100	320
All waters where the salinity is greater than 1 ppth more than 5 percent of the time	Enterococci	30	110
The waterbody GM shall not be greater than the applicable GM magnitude in any six-week interval, calculated weekly. The applicable STV shall not be exceeded by more than 10 percent of the samples collected in a CALENDAR MONTH, calculated in a static manner.			
NGI = National Epidemiological and Environmental Assessment of Recreational Water gastrointestinal illness rate		GM = geometric mean STV = statistical threshold value cfu = colony forming units	mL = milliliters ppth = parts per thousand

Water Quality Standards Assessment

When applying the listing and delisting factors contained in the Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List, the GEOMETRIC MEAN and STV shall be used as follows, unless a situation-specific weight of the evidence factor is being applied: Only the GEOMETRIC MEAN values shall be applied based on a statistically sufficient number of samples, which is generally not less than five samples distributed over a six-week period. However, if a statistically sufficient number of samples is not available to calculate the GEOMETRIC MEAN, then attainment of the water quality standard shall be determined based only on the STV. When making a listing or delisting decision based on the situation-specific weight of the evidence factor and if beach use or beach closure information is available, such information shall be evaluated.

3. Interaction of Bacteria Water Quality Objectives with Basin Plans

The BACTERIA WATER QUALITY OBJECTIVES supersede numeric water quality objectives for bacteria for the REC-1 beneficial use contained in a BASIN PLAN prior to February 4, 2019. The BACTERIA WATER QUALITY OBJECTIVES do not supersede any narrative water quality objective or numeric SITE-SPECIFIC WATER QUALITY OBJECTIVE for bacteria established for the REC-1 beneficial use.

Total maximum daily loads (TMDLs) established before February 4, 2019 to implement numeric water quality objectives for bacteria are in effect for numerous waterbodies throughout the state. Such TMDLs remain in effect where a BACTERIA WATER QUALITY OBJECTIVE supersedes a water quality objective for bacteria for which the TMDL was established. A Regional Water Board may convene a public meeting to evaluate the effectiveness of the TMDL in attaining the BACTERIA WATER QUALITY OBJECTIVE.

IV. IMPLEMENTATION

E. Bacteria

1. Applicability of Bacteria Water Quality Objectives

The BACTERIA WATER QUALITY OBJECTIVES shall be implemented, where applicable, through National Pollutant Discharge Elimination System (NPDES) permits issued pursuant to section 402 of the Clean Water Act, water quality certifications issued pursuant to section 401 of the Clean Water Act, waste discharge requirements (WDRs), and waivers of WDRs. However, where a permit, WDR, or waiver of WDR includes an effluent limitation or discharge requirement derived from a water quality objective, guideline, or other requirement to control bacteria that is a more stringent value than the applicable

BACTERIA WATER QUALITY OBJECTIVE, the BACTERIA WATER QUALITY OBJECTIVE shall not be implemented in the permit, WDR, or waiver of WDR.

The GEOMETRIC MEAN and the STV contained in the applicable BACTERIA WATER QUALITY OBJECTIVES shall be applied in all circumstances, except in the context of a TMDL or a BASIN PLAN amendment. In the context of a TMDL or a BASIN PLAN amendment, Regional Water Boards may implement a reference system/antidegradation approach or natural sources exclusion approach in accordance with Chapter IV.E.2. A TMDL that implements either approach is subject to U.S. EPA's approval authority under Clean Water Act section 303(d) and such a TMDL or a BASIN PLAN amendment that implements either approach may be subject to U.S. EPA's approval authority under Clean Water Act section 303(c).

2. Natural Sources of Bacteria

a. Applicability

The implementation provisions contained in Chapter IV.E.2 apply to municipal storm water discharges regulated pursuant to Clean Water Act section 402(p) and non-point source discharges except on-site wastewater treatment system discharges. These implementation provisions do not apply to NPDES discharges other than municipal storm water discharges.

b. Reference System/Antidegradation Approach and Natural Sources Exclusion Approach

In the context of a TMDL or a BASIN PLAN amendment developed to implement the BACTERIA WATER QUALITY OBJECTIVES, a reference system/antidegradation approach may be utilized to ensure: (1) bacteriological water quality is at least as good as that of an applicable REFERENCE SYSTEM, and (2) no degradation of existing water quality is allowed when the existing water quality is better than the REFERENCE SYSTEM. In such circumstances, the TMDL or BASIN PLAN amendment may include a certain frequency of exceedance of the applicable BACTERIA WATER QUALITY OBJECTIVES based on the observed exceedance frequency in the applicable REFERENCE SYSTEM or the targeted water body, whichever is less.

In the context of a TMDL or a BASIN PLAN amendment developed to implement the BACTERIA WATER QUALITY OBJECTIVES, a natural source exclusion approach may be utilized after all anthropogenic sources of bacteria are identified, quantified, and controlled. In such circumstances, the TMDL or BASIN PLAN amendment may include a certain frequency of exceedance of the applicable BACTERIA WATER QUALITY OBJECTIVES based on the observed exceedance frequency of the identified and quantified natural sources of bacteria of the targeted water body.

3. High Flow Suspension of the Water Contact Recreation (REC-1) Beneficial Use

A WATER BOARD may adopt a high flow suspension of the water contact recreation (REC-1) beneficial use that reflects water conditions considered unsafe for the REC-1 beneficial use due to high water flow or velocity. A rainfall measure, flow measure, or other requirements shall be established by the WATER BOARD to describe specific conditions during which the high flow suspension would apply. To adopt a high flow suspension of the REC-1 beneficial use, the WATER BOARD must conduct a USE ATTAINABILITY ANALYSIS. A WATER BOARD's adoption of a high flow suspension of the REC-1 beneficial use is subject to review and approval by the State Water Board (if the adopting WATER BOARD is a Regional Water Board) and U.S. EPA.

If a high flow suspension of the REC-1 beneficial use is adopted, the BACTERIA WATER QUALITY OBJECTIVE for the REC-1 beneficial use does not apply during the period of time that the REC-1 use is suspended; however, during all other times outside of the period of the high flow suspension, the BACTERIA WATER QUALITY OBJECTIVE for the REC-1 use applies. All other applicable public health-related beneficial uses need to be protected during the period of the high flow suspension.

4. Seasonal Suspension of the Water Contact Recreation (REC-1) Beneficial Use

A WATER BOARD may adopt a seasonal suspension of the water contact recreation (REC-1) beneficial use to reflect water conditions considered inapplicable or unsafe for the REC-1 beneficial use due to low water flows, low water temperatures, or conditions that freeze water. A flow measure, water temperature measure, or other condition(s) shall be established by the WATER BOARD to describe specific conditions during which the seasonal suspension would apply. To adopt a seasonal suspension of the REC-1 beneficial use, the WATER BOARD must conduct a USE ATTAINABILITY ANALYSIS. A WATER BOARD's adoption of a seasonal suspension of the REC-1 beneficial use is subject to review and approval by the State Water Board (if the adopting WATER BOARD is a Regional Water Board) and U.S. EPA.

If a seasonal suspension of the REC-1 beneficial use is adopted, the BACTERIA WATER QUALITY OBJECTIVE for the REC-1 beneficial use does not apply during the period of the seasonal suspension; however, during all other times outside of the period of the seasonal suspension, the BACTERIA WATER QUALITY OBJECTIVE for the REC-1 use applies. All other applicable public health-related beneficial uses need to be protected during the period of the seasonal suspension.

5. Limited Water Contact Recreation (LREC-1) Designation

A WATER BOARD may designate a water body or waterbody segment(s) with the Limited Water Contact Recreation (LREC-1) beneficial use. A WATER BOARD must conduct a USE ATTAINABILITY ANALYSIS if application of the LREC-1 beneficial use requires a less stringent water quality objective for bacteria than the previously applicable BACTERIA WATER QUALITY OBJECTIVE for the REC-1 use. A WATER BOARD's designation of the LREC-1 beneficial use is subject to review and approval by the State Water Board (if the adopting WATER BOARD is a Regional Water Board) and U.S. EPA.

F. WATER QUALITY STANDARDS VARIANCES

Federal regulations establish an explicit regulatory framework for the adoption of a water quality standards variance (WQS VARIANCE) that states may use to implement adaptive management approaches to improve water quality (40 C.F.R. § 131.14 (herein referred to as the federal rule)). A WATER BOARD is not required to adopt specific authorizing provisions into state law before establishing a WQS VARIANCE consistent with the federal rule. The following explains the existing requirements that a WATER BOARD must follow to establish a WQS VARIANCE consistent with the federal rule.

Under the federal rule, a WQS VARIANCE may be adopted for one or more NPDES dischargers or for a water body or waterbody segment, but the WQS VARIANCE only applies to the discharger(s) or the water body or waterbody segment specified in the WQS VARIANCE.

The federal rule specifies that any WQS VARIANCE is not effective unless and until it is approved by U.S. EPA. The federal rule also specifies that a WQS VARIANCE is subject to the public participation requirements at 40 Code of Federal Regulations section 131.20(b), which requires that one or more public hearings be held in accordance with state law and U.S. EPA's public participation regulation (40 C.F.R. part 25).

Where a discharger-specific WQS VARIANCE is established by a single permit, including an individual permit or a general permit, or other order, the federal rule's public participation requirements must be satisfied, and the provisions in the permit or other order that rely upon the discharger-specific WQS VARIANCE must be conditioned upon U.S. EPA approval. Because the establishment of a discharger-specific WQS VARIANCE in such a permit or other order is not the establishment or revision of a rule, the permit action need not be accompanied by a rulemaking action. The applicable hearing requirement for any other WQS VARIANCE would be subject to the hearing requirement and other procedures applicable to revising a water quality control plan, which are consistent with the federal rule's public participation requirements.

Attachment A. Glossary

BACTERIA WATER QUALITY OBJECTIVE(S): The bacteria water quality objectives set forth in Chapter III.E.2.

BACTERIA PROVISIONS: The Limited Water Contact Recreation (LREC-1) beneficial use contained in Chapter II, the BACTERIA WATER QUALITY OBJECTIVES contained in Chapter III, and the implementation sections contained in Chapter IV.

CALENDAR YEAR: A period of time defined as twelve consecutive CALENDAR MONTHS.

CALENDAR MONTH(S): A period of time from a day of one month to the day before the corresponding day of the next month if the corresponding day exists, or if not to the last day of the next month (e.g., from January 1 to January 31, from June 15 to July 14, or from January 31 to February 28).

BASIN PLAN: A water quality control plan, often referred to as a basin plan, which consists of a designation or establishment for the waters within a specified area of all of the following: (1) beneficial uses to be protected, (2) water quality objectives, and (3) a program of implementation needed for achieving water quality objectives.

GEOMETRIC MEAN (GM): The geometric mean is a type of mean or average that indicates the central tendency or typical value of a set of numbers by using the product of their values (as opposed to the arithmetic mean which uses their sum). The geometric mean is defined as the n th root of the product of n numbers. The formula is expressed as: $GM = \sqrt[n]{(x_1)(x_2)(x_3) \dots (x_n)}$, where x is the sample value and n is the number of samples taken.

REFERENCE SYSTEM: A watershed or water body segment determined by the WATER BOARD to be minimally disturbed by anthropogenic stressors but otherwise is representative of conditions of the assessed site, watershed, or water body segment.

SITE-SPECIFIC WATER QUALITY OBJECTIVE: A water quality objective that reflects site-specific conditions. It may be appropriate to develop a water quality objective for a site when it is determined that the otherwise applicable objective is inappropriate for the water body (i.e., based on site-specific conditions the applicable objective does not protect the beneficial use or a less stringent objective is warranted).

STATISTICAL THRESHOLD VALUE (STV): The STV for the BACTERIA WATER QUALITY OBJECTIVES is a set value that approximates the 90th percentile of the water quality distribution of a bacterial population. For the BACTERIA WATER QUALITY OBJECTIVES, the STV for *E. coli* is 320 cfu/100 mL and the STV for enterococci is 110 cfu/100mL.





































USE ATTAINABILITY ANALYSIS: A structured scientific assessment of the factors affecting the attainment of a water body's designated use, including physical, chemical,










biological, and economic factors, in accordance with 40 Code of Federal Regulations section 131.10(g).





































WATER BOARD(S): The individual or collective regulatory entity or entities consisting of the State Water Resources Control Board and/or the nine Regional Water Quality Control Boards.

















WQS VARIANCE(S): A water quality standards variance, as defined by 40 Code of Federal Regulations section 131.3(o), is a time-limited designated use and criterion for a specific pollutant(s) or water quality parameter(s) that reflect the highest attainable condition during the term of the water quality standards variance.

EXHIBIT “11”

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EXHIBIT “12”

Quarterly Reports

Date	Title	Time Frame
2-1-2021	2020 Q4 Monitoring Report	October 2020 – December 2020
4-30-2021	2021 Q1 Monitoring Report	January 2021 – March 2021
7-29-2021	2021 Q2 Monitoring Report	April 2021 – June 2021
10-29-2021	2021 Q3 Monitoring Report	July 2021 – September 2021
2-1-2022	2021 Q4 Monitoring Report	October 2021 - December 2021
4-27-2022	2022 Q1 Monitoring Report	January 2022 – March 2022

Annual Reports

Date	Title	Time Frame
10-15-2021	Fiscal Year 2020 – 2021 Annual Monitoring Report	July 2020 – June 2021

EXHIBIT “13”

*NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
GENERAL PERMIT FOR
WASTE DISCHARGE REQUIREMENTS (WDRs)
FOR
STORM WATER DISCHARGES FROM SMALL MUNICIPAL SEPARATE STORM
SEWER SYSTEMS (MS4s)

ORDER NO. 2013-0001-DWQ
NPDES NO. CAS000004

This Order was adopted by the State Water Resources Control Board on:	February 5, 2013
This Order shall become effective on:	July 1, 2013
This Order shall expire on:	June 30, 2018

IT IS HEREBY ORDERED that, as of July 1, 2013, this Order supersedes Order No. 2003-0005-DWQ.

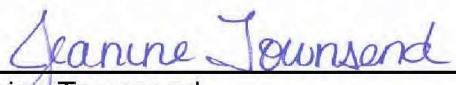
I, Jeanine Townsend, Clerk to the Board, do hereby certify that this Order, with all attachments, is a full, true, and correct copy of an Order adopted by the State Water Resources Control Board, on **February 5, 2013**.

AYE: Chairman Charles R. Hoppin
Vice Chair Frances Spivy-Weber
Board Member Tam M. Doduc
Board Member Steven Moore
Board Member Felicia Marcus

NAY: None

ABSENT: None

ABSTAIN: None



Jeanine Townsend
Clerk to the Board

**STATE WATER RESOURCES CONTROL BOARD
WATER QUALITY ORDER NO. 2013-0001-DWQ
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
GENERAL PERMIT NO. CAS000004**

**WASTE DISCHARGE REQUIREMENTS (WDRs)
FOR
STORM WATER DISCHARGES FROM SMALL MUNICIPAL SEPARATE STORM SEWER
SYSTEMS (MS4s) (GENERAL PERMIT)**

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FINDINGS

The State Water Resources Control Board (State Water Board) finds that:

1. Storm water is a resource and an asset and should not be treated as a waste product. Managing rainwater and storm water at the source is a more effective and sustainable alternative to augmenting water supply, preventing impacts from flooding, mitigating storm water pollution, creating green space, and enhancing fish and wildlife habitat. California encourages alternative, innovative, multi-objective solutions to help use and protect this valuable resource, while at the same time controlling pollution due to urban runoff.
2. As human population increases, urban development creates new pollution sources and brings with it proportionately higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, trash, etc. which can either be washed or directly dumped into the municipal separate storm sewer system (MS4). As a result, the runoff leaving the developed urban area is greater in pollutant load than the pre-development runoff from the same area. Also, when natural vegetated pervious ground cover is converted to impervious surfaces such as paved highways, streets, rooftops, walkways and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving developed urban area is significantly greater in runoff volume, velocity, peak flow rate, and duration than pre-development runoff from the same area. The increased volume, velocity, rate, and duration of runoff greatly accelerate the erosion of downstream natural channels. In addition, the greater the impervious cover the greater the significance of the degradation.
3. Pollutants of concern found in urban runoff include sediments, non-sediment solids, nutrients, pathogens, oxygen-demanding substances, petroleum hydrocarbons, heavy metals, floatables, polycyclic aromatic hydrocarbons (PAHs), trash, pesticides and herbicides.
4. Trash and litter are a pervasive problem in California. Controlling trash is a priority, because trash adversely affects our use of California's waterways. Trash impacts aquatic life in streams, rivers, and the ocean as well as terrestrial species in adjacent riparian and shore areas. Trash, particularly plastics, persists for years. It concentrates organic toxins, entangles and ensnares wildlife, and disrupts feeding when animals mistake plastic for food and ingest it. Additionally, trash creates aesthetic impacts, impairing our ability to enjoy our waterways.
5. The State Water Resources Control Board (State Board) is developing a statewide policy for trash control in California's waterways. The draft Trash Policy will identify trash as a separate pollutant and establish methods to control trash pollution in waterways, statewide. Following adoption of the draft Trash Policy, the State Water Board may re-open this Order to incorporate water body trash pollution control methods and introduce Trash Reduction Program requirements.
6. A higher percentage of impervious area in urban areas correlates to a greater pollutant loading, resulting in turbid water, nutrient enrichment, bacterial contamination, organic matter loads, toxic compounds, temperature increases, and increases in trash or debris.
7. Conventional landscaping features large lawns, non-native plants, abundant irrigation, and heavy use of fertilizers, herbicides, and pesticides. It frequently requires significant mowing,

blowing, trimming, and removal of plants debris. Adopting more storm water-friendly landscape practices reduces pollutants and also provides tangible water conservation, wildlife habitat, and energy saving benefits.

8. The State Water Board recognizes that this Order affects varied and diverse entities, including agencies that are required to carry out water conservation regulations, wastewater discharge regulations, and land use regulations that may implement, all or in part, provisions of this Order. The State Water Board seeks to minimize duplicate efforts and maximize resources to achieve the greatest water quality benefit; thus the State Water Board recognizes specified related regulations, cited in the body of this Order, as equivalent to implementing designated provisions of this Order.
9. When water quality impacts are considered during the planning stages of a project, new development and many redevelopment projects can more efficiently incorporate measures to protect water quality.
10. In California, urban storm water is listed as the primary source of impairment for ten percent of all rivers, ten percent of all lakes and reservoirs, and 17 percent of all estuaries (2010 Integrated Report). Although these numbers may seem low, urban areas cover just six percent of the land mass of California and so their influence is disproportionately large. Urbanization causes changes in the landscape, including increased loads of chemical pollutants, increased toxicity, changes to flow magnitude, frequency, and seasonality of various discharges, physical changes to stream, lake, or wetland habitats, changes in the energy dynamics of food webs, sunlight, and temperature; and biotic interactions between native and exotic species. In addition to surface water impacts, urbanization can alter the amount and quality of storm water that infiltrates and recharges groundwater aquifers.
11. Education and awareness programs help change human behavior with respect to reducing the amount of pollution generated from storm water sources within the Permittee's MS4 system. In addition to education, encouraging public participation in local storm water programs can lead to program improvement as well as enabling people to identify and report a pollution-causing activity, such as spotting an illicit discharge.
12. Field experience in conducting outfall surveys indicates that illicit discharges may be present at 2 to 5 percent of all outfalls at any given time. Given that pollutants are being introduced into the receiving water during dry weather, illicit discharges may have an amplified effect on water quality and biological diversity.¹ Therefore, implementation of an effective Illicit Discharge and Detection Elimination program in conjunction with focused wet weather monitoring, as necessary, is an essential component of an effective municipal storm water program.
13. In 1990, the U.S. Environmental Protection Agency (U.S. EPA) promulgated rules establishing Phase I of the National Pollutant Discharge Elimination System (NPDES) storm water program. The Phase I program for MS4s requires operators of "medium" and "large" MS4s, that is, those that generally serve populations of 100,000 or greater, to implement a storm water management program as a means to control polluted discharges from these MS4s.

¹

Urban Stormwater Management in the United States, National Research Council, 2008

14. A MS4 is a conveyance or system of conveyances that is: 1) owned by a state, city, town, village, or other public entity that discharges to waters of the United States; 2) designed or used to collect or convey storm water (including storm drains, pipes, ditches, etc.); 3) not a combined sewer; and 4) not part of a Publicly Owned Treatment Works or sewage treatment plant.
15. On December 8, 1999, U.S. EPA promulgated Phase II storm water regulations under authority of the Clean Water Act section 402(p)(6). The Phase II Storm Water requires State Water Board to issue NPDES storm water permits to operators of Small MS4s.
16. On April 30, 2003, the State Water Board adopted [Water Quality Order No. 2003-0005-DWQ](#), NPDES General Permit CAS000004 WDRs for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems (General Permit) to comply with Clean Water Act section 402(p)(6).
17. Title 40 of the Code of Federal Regulations (40 C.F.R.) section 122.26(b)(16) defines Small MS4s as those not defined as “large” or “medium” MS4s under section 122.26(b)(4) or (b)(7) or designated under 40 Code of Federal Regulations section 122.26(a)(1)(v). The term Small MS4s includes systems similar to separate storm sewer systems in municipalities, such as systems at military bases, large hospital or prison complexes, and highways and other thoroughfares. (40 C.F.R. §122.26(b)(16)(iii).) These latter subsets of Small MS4s are referred to herein as Non-traditional Small MS4s. Non-traditional Small MS4s discharge the same types of pollutants that are typically associated with urban runoff. Separate storm sewers in very discrete areas, such as individual buildings, are not defined as Small MS4s.
18. Of the Small MS4s defined by federal regulations, only “Regulated Small MS4s” (also referred to as “Permittees” herein) must obtain an NPDES permit. Small MS4s are designated as Regulated Small MS4s in this Order in accordance with the criteria described in Findings 19-25.²
19. Under 40 Code of Federal Regulations section 122.32(a)(1) all Small MS4s located within an “urbanized area” as determined by the latest Decennial Census by the Bureau of the Census (Urbanized Area) are automatically designated as Regulated Small MS4s.
20. Under 40 Code of Federal Regulations sections 122.32(a)(2) and 123.35(b) the State Water Board is directed to develop a process, as well as criteria, to designate Small MS4s located outside of an Urbanized Area as Regulated Small MS4s. These criteria are to evaluate whether a storm water discharge results in or has the potential to result in exceedances of water quality standards, including impairment of designated uses, or other significant water quality impacts, including habitat and biological impacts.
21. Under guidance provided in 40 Code of Federal Regulations section 123.35(b)(1)(ii), for determining other significant water quality impacts, U.S. EPA recommends a balanced consideration of the following designation criteria on a watershed or other local basis: discharge to sensitive waters, high growth or growth potential, high population density,

² In addition to the designation criteria specified in this Order, the State Water Board may designate a Small MS4 as a Regulated Small MS4 in response to a petition received under 40 Code of Federal Regulations section 122.26(f). Any person may petition the State Water Board to require an NPDES permit for a discharge composed entirely of storm water that contributes to a violation of a water quality standard or is a significant contributor of pollutants to the waters of the United States. (*Id.*). The State Water Board must make a final determination on any petition within 180 days after receiving the petition. (40 C.F.R. [§123.35\(c\)](#).)

contiguity to an urbanized area, significant contributor of pollutants to waters of the U.S., and ineffective protection of water quality by other programs.

22. The State Water Board is required to apply the designation criteria at a minimum to all Small MS4s located outside of Urbanized Areas serving jurisdictions with a population density of at least 1,000 people per square mile and a population of at least 10,000. (40 C.F.R. §123.35(b)(2).) The State Water Board has discretion to apply the criteria to jurisdictions with smaller population or lower density. All such jurisdictions are then Regulated Small MS4s.
23. In developing the designation criteria, the State Water Board included factors indicative of the potential to result in exceedances of water quality standards and other significant water quality impacts. The following criteria are used to designate Small MS4s outside of Urbanized Areas as Regulated Small MS4s in this Order.
 - a. The Small MS4 has high population *and* high population density – High population means a population of 10,000 or more. High population density means a density of 1,000 residents per square mile or greater. Also to be considered in this definition is a high density created by a non-residential population, such as tourists or commuters.
 - b. The Small MS4 discharges to Areas of Special Biological Significance (ASBS) as defined in the California Ocean Plan.
24. Designation of additional Small MS4s as Regulated Small MS4s may be made by the Regional Water Boards on a case by case basis. Case by case determinations of designation shall be based on the potential of a Small MS4's discharges to result in exceedances of water quality standards, including impairment of designated uses, or other significant water quality impacts, including habitat and biological impacts. Where such case by case designations have been recommended by the Regional Water Boards prior to adoption of this Order, the designated Small MS4s are listed on the relevant Attachments to the Order and the reasons for designation are laid out in the Fact Sheet. The Regional Water Boards may continue to make case by case determinations of designation during the permit term. Such designations must be approved by the Regional Water Board after public review and comment.
25. 40 Code of Federal Regulations section 123.35(b)(4) requires designation as a Regulated Small MS4 of any Small MS4 outside an Urbanized Area that contributes substantially to the pollutant loadings of a physically interconnected MS4 regulated by the NPDES storm water program. A Small MS4 is interconnected with a separately permitted MS4 if storm water that has entered the Small MS4 is allowed to flow directly into a permitted MS4. In general, if the Small MS4 discharges more than ten percent of its storm water to the permitted MS4, or its discharge makes up more than ten percent of the permitted MS4's total storm water volume, it is a significant contributor of pollutants to the permitted MS4. In specific cases, the MS4s involved or third parties may show that the ten percent threshold is inappropriate for the MS4 in question.
26. Regulated Small MS4s may seek a waiver from Phase II requirements if they meet criteria specified in 40 Code of Federal Regulations sections 122.32(c)-(e).³ The State

³ Waiver criteria also found at 40 C.F.R. 123.35(d).

Water Board has additionally provided for a waiver for those communities outside of urbanized areas with a population of 20,000 or less with an annual median household income (MHI) that is less than 80 percent of the statewide annual MHI. (Wat. Code, § 79505.5, subd. (a)).

27. Small MS4s face highly variable conditions both in terms of threats to water quality from their storm water discharges and resources available to manage those discharges. Therefore, one set of prescriptive requirements is not an appropriate regulatory approach for all Regulated Small MS4s. This Order distinguishes between New and Renewal Traditional Small MS4 Permittees. Additionally, this Order addresses differences between Traditional and Non-traditional Small MS4s by detailing Non-traditional Small MS4 specific provisions in Section F Non-Traditional Small MS4 Provisions. Provisions are tailored to address the diverse program structures of Non-traditional Small MS4s to allow for an appropriate regulatory approach.
28. There are variable levels of resources available to Regulated Small MS4s for public outreach and education and water quality monitoring. Recognizing this, the Order gives Permittees numerous compliance options in these two program areas. However, all Regulated Small MS4s that discharge to ASBS or impaired water bodies⁴ must conduct monitoring as specified in Attachment C and Attachment G, respectively. All Regulated Small MS4s with a population of 50,000 or more must conduct monitoring specified in Sections E.13.d.1. or E.13.d.2. of the Order or as approved by the Executive Officer of the applicable Regional Board. Additionally, for the public outreach program, the Regional Water Boards may require the Regulated Small MS4s to utilize the approach of Community-Based Social Marketing.
29. Renewal Traditional Small MS4 Permittees shall comply with Section E. Certain provisions within Section E contain compliance dates that are past the effective date of this Order, in these cases, the Permittee shall implement its existing program until that date.
30. This Order modifies the existing General Permit, Order 2003-0005-DWQ by establishing the storm water management program requirements in the Order and defining the minimum acceptable elements of the municipal storm water management program. Minimum permit requirements are known at the time of permit issuance and not left to be determined later through Regional Water Board review and approval of Storm Water Management Plans (SWMPs).
31. The State Water Board recognizes the necessity of a storm water program guidance document specific to each Permittee to provide planning and guidance for each program area and to identify responsible implementing parties. Permittees must develop and implement a storm water program guidance document and must submit the document during the application process.
32. The State Water Board recognizes that in some instances Renewal Permittees' SWMPs that were approved under the prior General Permit, Order 2003-0005-DWQ have incorporated BMPs designed to address locality-specific storm water issues and that in some cases these

⁴ A waterbody that has been determined under state policy and federal law not meet water quality standards. An impaired water is a water that has been listed on the California 303(d) list or has not yet been listed but otherwise meets the criteria for listing. A water is a portion of a surface water of the state, including ocean, estuary, lake, river, creek, or wetland. The water currently may not be meeting state water quality standards or may be determined to be threatened and have the potential to not meet standards in the future. The State of California's 303(d) list can be found at <http://www.swrcb.ca.gov/quality.html>.

BMPs may, because of locality-specific factors, be more protective of water quality than the minimum requirements established by this Order. Renewal Permittees will additionally include in the guidance document the following: identification and brief description of each BMP and associated measurable goal included in the Permittee's previously approved SWMP under the prior General Permit, Order 2003-0005-DWQ, that constitutes a more specific local or tailored level of implementation that may be more protective of water quality than the minimum requirements of this Order; and identification of whether the Permittee proposes to maintain, reduce, or cease implementation for each more protective, locally-tailored BMP. In no instance may a BMP be reduced or ceased if it is required by the minimum standards set by this Order.

33. Minimum measures have been established in this Order to simplify assessment of compliance and allow the public to more easily assess each Permittee's compliance.
34. Each provision establishes the required task description, minimum implementation levels (i.e., escalating enforcement, reporting requirements for tracking projects, number of monitoring sites, etc.), and reporting elements to substantiate that the Permittee meets these implementation levels. Regional Water Board staff will be able to evaluate each individual Permittee's compliance through Annual Report review and the program evaluation (audit) process.
35. The provisions contained in this Order were derived from two main U.S. EPA documents: MS4 Program Evaluation Guide⁵ and the MS4 Permit Improvement Guide⁶ along with interviews and information gathered from a lengthy collaborative stakeholder process.
36. Consistent with Clean Water Act section 402(p)(3)(B)(iii), this Order requires controls to reduce pollutants from the MS4 to the maximum extent practicable (MEP). The MEP standard requires Permittees to apply Best Management Practices (BMPs) that are effective in reducing or eliminating the discharge of pollutants to the waters of the U.S. MEP emphasizes pollutant reduction and source control BMPs to prevent pollutants from entering storm water runoff. MEP may require treatment of the storm water runoff if it contains pollutants. The MEP standard is an ever-evolving, flexible, and advancing concept, which considers technical and economic feasibility. BMP development is a dynamic process and may require changes over time as the Permittees gain experience and/or the state of the science and art progresses. To do this, the Permittees must conduct and document evaluation and assessment of each relevant element of its program, and their program as a whole, and revise activities, control measures/BMPs, and measurable goals, as necessary to meet MEP. MEP is the cumulative result of implementing, evaluating, and creating corresponding changes to a variety of technically appropriate and economically feasible BMPs, ensuring that the most appropriate BMPs are implemented in the most effective manner.
37. The Order's Receiving Water Limitations language is consistent with [State Water Board Order WQ 99-05](#) (*Orange County*) adopted by the State Water Board on June 17, 1999. Receiving Water Limitations apply to all Permittees subject to this Order. The State Water Board held a workshop on November 20, 2012, to hear comments on the receiving water limitations provisions in MS4 permits. This Order has a reopener clause that will allow the State Water Board to reopen the Order if the Board directs changes to the Receiving Water Limitations language based on comments received.
38. Non-storm water discharges consist of all discharges from an MS4 that do not originate from precipitation events. This Order effectively prohibits non-storm water discharges through an

⁵ Municipal Separate Storm Sewer System (MS4) Program Evaluation Guidance, USEPA, EPA-833-R-07-003, January 1, 2007

⁶ MS4 Permit Improvement Guide, USEPA, April 1, 2010

MS4 into waters of the U.S. Certain categories of non-storm water discharges are conditionally exempt as specified at 40 Code of Federal Regulations section 122.26(d)(2)(iv)(B)(1). Non-storm water discharges that are regulated by a separate NPDES permit are not subject to the discharge prohibition. Prohibited non-storm water discharges include conditionally exempt discharges that are found to be a significant source of pollutants to waters of the U.S.

39. Non-storm water discharges to ASBS are prohibited except as specified in the General Exception. Certain enumerated non-storm water discharges are allowed under the General Exception if essential for emergency response purposes, structural stability, slope stability, or if occur naturally. In addition, an NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS. This Order allows utility vault discharges to an MS4 with a direct discharge to an ASBS, provided the discharge is authorized by the General NPDES Permit for Discharges from Utility Vaults and Underground Structures to Surface Water, NPDES No. CAG 990002. The State Water Board is in the process of reissuing the General NPDES Permit for Utility Vaults. As part of the renewal, the State Water Board will require a study to characterize representative utility vault discharges to an MS4 with a direct discharge to an ASBS and will impose conditions on such discharges to ensure the discharges do not alter natural ocean water quality in the ASBS. Given the limited number and intermittent nature of utility vault discharges to MS4s that discharge directly to an ASBS, the State Water Board finds that discharges from utility vaults and underground structures to an MS4 with a direct discharge to an ASBS are not expected to result in a substantial alteration of natural ocean water quality in the ASBS in the interim period while the General NPDES Permit for Discharges from Utility Vaults is renewed and the study is completed. Other short-duration, intermittent non-storm water discharges related to LUPs (e.g. groundwater dewatering, potable water system flushing, hydrotest discharges) are regulated under NPDES permits issued by the Regional Water Boards. Although such discharges are not specifically enumerated in the General Exception as essential for emergency response purposes, structural stability, or slope stability, they may be required to ensure the safety and stability of the utility systems or for operations and maintenance and for extending these essential services. For this reason, and because the short-duration and intermittent nature of these discharges renders them unlikely to result in substantial alteration of natural ocean water quality in the ASBS, this Order permits such discharges to a segment of the MS4 with a direct discharge to an ASBS provided they are authorized by an NPDES permit issued by the State Water Board or relevant Regional Water Board. However, if a Regional Water Board determines a specific discharge from a utility vault or underground structure does alter the natural ocean water quality in an ASBS, the Regional Water Board may prohibit the discharge as specified in this Order.
40. Total Maximum Daily Loads (TMDL) are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations) and non-point sources (load allocations), background contribution, plus a margin of safety. Discharges from Small MS4s are point source discharges subject to TMDLs. This Order requires Permittees to comply with all applicable TMDLs approved pursuant to 40 Code of Federal Regulations section 130.7 that assign a Waste Load Allocation to Permittee and that have been identified in Attachment G. The high variance in the level of detail and specificity of TMDLs necessitates the development of more specific permit requirements in many cases to provide clarity to the Permittees regarding responsibilities for compliance. The Regional Water Boards have submitted TMDL-specific permit requirements to the State Water Board, for applicable TMDLs, along with statements explaining how the requirements are designed to achieve the goals of the TMDLs (incorporated into the Fact Sheet). The TMDL-specific permit requirements are summarized

in Attachment G and are an enforceable component of this Order. The Regional Water Boards are additionally being directed through this Order to review the TMDL-specific permit requirements of Attachment G in consultation with the Permittees and the State Water Board staff and propose any revisions to the State Water Board within one year of the effective date of this Order. TMDLs applicable to non-traditional dischargers in the region of the Los Angeles Regional Water Board are listed in Attachment G without TMDL-specific permit requirements. The Los Angeles Water Board is being directed to develop and propose TMDL-specific permit requirements for Attachment G in consultation with the Permittees and the State Water Board staff within one year of the effective date of this Order. Any such revisions will be incorporated into the permit through a reopener.

41. Degraded watershed processes lead to degraded water quality. To fully protect beneficial uses, post-construction runoff retention and hydromodification control criteria for individual projects must be derived with a knowledge of dominant watershed processes. Watershed management zones will be delineated by the State Board during this permit term. The Watershed management zones will be used to identify applicable areas and appropriate criteria for runoff retention and hydromodification control to be incorporated into the next permit. Regional Water Boards that approve watershed process-based criteria for post-construction during this permit term will be permitted to require Permittees to implement these criteria.
42. The post-construction requirements and design standards contained in this Order are consistent with [State Water Board Order WQ 2000-11](#) (*Bellflower*).
43. State Water Board, California State Parks and the State Historic Preservation Officer may coordinate efforts to manage post-construction projects involving historic sites, structures or landscapes that cannot alter their original configuration in order to maintain their historic integrity.
44. Permittees will submit Annual Reports electronically using the State Water Board's Storm Water Multi-Application Reporting and Tracking System (SMARTS). The purpose of the Annual Report is to evaluate (1) the implementation of Permittees' storm water program; (2) the effectiveness of BMPs and Measurable Goals, (3) the Permittee's improvement opportunities to achieve MEP, and (4) any supplemental information required by a Regional Water Board in accordance with the Regional Water Board's specific requirements.
45. To apply for General Permit coverage authorizing storm water discharges to surface waters pursuant to this Order, the Permittees shall electronically file a Notice of Intent (NOI) using SMARTS and mail the appropriate permit fee to the State Water Board. The NOI represents the Permittee's commitment to comply with the BMPs specified in this Order to achieve compliance with the minimum control measures specified at 40 Code of Federal Regulations sections 122.34 (b)(1) through (b)(6).
46. Under 40 Code of Federal Regulations section 122.35, a Separate Implementing Entity (SIE) can implement a storm water management program for another entity such as a municipality, agency, or special district. The SIE implements parts or all of a storm water program for a Permittee. Permittees relying on a SIE to implement their entire program must electronically file an NOI using SMARTS and mail appropriate fee to the State Water Board.
47. Each Permittee is individually responsible for adoption and enforcement of ordinances and/or policies, implementation of identified control measures/BMPs needed to prevent or reduce pollutants in storm water and operation and maintenance (O&M). Enforcement actions concerning this Order will be pursued only against the individual Permittee responsible for specific violations of this Order.

48. In accordance with 40 Code of Federal Regulations section 122.28(b)(3), a Regional Water Board may issue an individual MS4 NPDES Permit to a Permittee otherwise subject to this Order, or adopt an alternative general permit that covers storm water discharges regulated by this Order. In accordance with Code of Federal Regulations section 122.34(b)(3), a Regulated Small MS4 in the same urbanized area as a medium or large MS4 may jointly with the medium or large MS4 seek a modification of the other MS4s permit to be added as a limited co-permittee. The applicability of this Order is automatically terminated on the effective date of the individual permit or joint permit or the date of approval for coverage under the alternative general permit.
49. Certain BMPs implemented or required by Permittees for urban runoff management may create a habitat for vectors (e.g., mosquitoes and rodents) if not properly designed or maintained. Close collaboration and cooperation among the Permittees, local vector control agencies, Regional Water Board staff, and the California Department of Public Health is necessary to identify and implement appropriate vector control measures that minimize potential nuisances and public health impacts resulting from vector breeding.
50. 40 Code of Federal Regulations section 131.12 requires that state water quality standards include an anti-degradation policy consistent with the federal policy. The State Water Board established California's anti-degradation policy in [State Water Board Resolution No. 68-16](#). Resolution No. 68-16 incorporates the federal anti-degradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Regional Water Board's Water Quality Control Plans (Basin Plans) implement, and incorporate by reference, both the State and federal anti-degradation policies.
51. This action to adopt an NPDES permit is exempt from the provisions of the California Environmental Quality Act (Public Resources Code § 21100, et seq.) in accordance with Water Code section 13389. (*County of Los Angeles v. Cal. Water Boards*, (2006), 143 Cal.App.4th 985.)
52. Following public notice in accordance with State and federal laws and regulations, the State Water Board, in a public hearing on August 8, 2012, heard and considered all comments. The State Water Board has prepared written responses to all significant comments.
53. The State Water Board has considered the costs of complying with this Order and whether the required BMPs meet the minimum MEP Standard required by federal law. Further discussion of cost of compliance is included in the Fact Sheet.
54. This Order shall serve and become effective as an NPDES permit and the Permittees shall comply with all its requirements pursuant to the timeframes identified within the permit.

IT IS HEREBY ORDERED that operators of Small MS4s subject to this Order shall comply with the following:

A. APPLICATION REQUIREMENTS FOR ALL SMALL MS4 PERMITTEES

Any Small MS4s designated under this Order that chooses to apply for an individual permit or request to join the permit of a Phase I Permittee must notify the Regional Water Board of its intent to do so by July 1, 2013. Census Designated Places (CDPs) listed on Attachment A that are located within an existing NPDES permit area are not required to file for separate coverage and pay separate fees.

A.1. Small MS4 Permittees (Except for Department of Defense and Department of Corrections and Rehabilitation Permittees)

- a. New Permittees shall electronically file an NOI via SMARTS and mail the appropriate fee to the State Water Board by July 1, 2013. Renewal Permittees shall electronically file an NOI via SMARTS and pay the appropriate application fee to the State Water Board. Any Renewal Permittees with paid 2013 application fee invoices shall receive a prorated refund. If the Permittee is designated as a Regulated Small MS4 by a Regional Water Board after adoption of this Order, the Permittee shall file the NOI and mail the appropriate fee within six months of the date of designation.
- b. General Permit coverage will be in effect upon receipt of the following:
 - 1) NOI via SMARTS
 - 2) Appropriate Fee (in accordance with the most recent fee schedule⁷)
 - 3) Permit boundary map delineating permit jurisdiction: At a minimum the map shall include the following:
 - (a) Phase II MS4 permit boundary based on 2010 Census data. For cities, the permit area boundary is the city boundary. For Counties, permit boundaries must include urbanized areas and places identified in Attachment A located within their jurisdictions. The boundaries must be proposed in the permit boundary map and may be developed in conjunction with the applicable Regional Water Board
 - (b) City/County Boundaries
 - (c) Main Arterial Streets
 - (d) Highways
 - (e) Waterways
 - (f) Phase I MS4 Permit Boundary (if applicable)
 - 4) Guidance document: The document shall at least include the following:

New Permittees:

 - (a) Overall program planning
 - (b) Identification of all permit requirements and responsible implementing parties

Renewal Permittees:

 - (a) Overall program planning
 - (b) Identification of all permit requirements and responsible implementing parties

⁷ California Code of Regulations, Title 23, Division 3, Chapter 9 Waste Discharge Reports and Requirements, Article 1 Fees.

- (c) Identification and brief description of each BMP and associated measurable goal included in the Permittee's most current SWMP that constitutes a more specific local or tailored level of implementation that may be more protective of water quality than the minimum requirements of this Order.
- (d) Identification of whether the Permittee will maintain, reduce, or cease implementation for each more protective, locally-tailored BMP.
- (e) For any more protective, locally-tailored BMP and associated measurable goal for which the Renewal Permittee will reduce or cease implementation, the Renewal Permittee shall demonstrate to the Executive Officer of the relevant Regional Water Board that the reduction or cessation is in compliance with this Order and the maximum extent practicable standard, and will not result in increased pollutant discharges. The demonstration by the Permittee will be subject to public comment before any approval by the Executive Officer of reduction or cessation of BMPs. In no instance may the Renewal Permittee reduce or cease a BMP if it is required by the minimum standards set by this Order.

The guidance document may be in spreadsheet, tabular or narrative format.

A.2. Department of Defense and Department of Corrections and Rehabilitation Permittees

- a. Permittee shall electronically file an NOI via SMARTS and mail the appropriate fee to the State Water Board by July 1, 2013. If the Permittee is designated as a Regulated Small MS4 by a Regional Water Board after adoption of this Order, the Permittee shall file the NOI and mail the appropriate fee within six months of the date of designation.
- b. General Permit coverage will be in effect upon receipt of the following:
 - 1) NOI via SMARTS
 - 2) Appropriate fee (in accordance with the most recent fee schedule⁸)
 - 3) Permit boundary map as developed by the Permittee

Renewal MS4s must continue implementing their current storm water management programs until submittal of a NOI via SMARTS.

A.3. Waiver Certification

Regulated Small MS4s may seek a waiver from the General Permit requirements if they meet criteria specified in 40 C.F.R. §122.32(c)-(e) or additional criteria specified in A.3.b.(3) below.

In order for a Regional Water Board to waive requirements for a Regulated Small MS4, (1) the Regulated Small MS4 must certify that its discharges do not cause or contribute to, or have the potential to cause or contribute to, a water quality impairment, and (2) the Regulated Small MS4 must meet one of the waiver options in Section b below:

- a. Waiver Certification Application Requirements - A Waiver Certification will only be in effect upon completion of the following:

⁸ California Code of Regulations. Title 23. Division 3. Chapter 9 Waste Discharge Reports and Requirements. Article 1 Fees.

- 1) Annual Waiver Certification submitted via SMARTS.
- 2) Annual Waiver Certification renewal fee of \$200 plus any applicable surcharge.
- 3) Letter via SMARTS from Regional Water Board or its Executive Officer waiving requirements.

Requirements are automatically waived if the Regional Water Board does not respond within six months.

b. Waiver Criteria

(1) Option 1

- (a) The jurisdiction served by the system is less than 1,000 people;
- (b) The system is not contributing substantially (as defined in Finding 25) to the pollutant loadings of a physically interconnected regulated MS4; and
- (c) If the small MS4 discharges any pollutants identified as a cause of impairment of any water body to which it discharges, storm water controls are not needed based on WLAs that are part of a U.S.EPA approved or established TMDL that addresses the pollutant(s) of concern.

(2) Option 2

- (a) The jurisdiction served by the system is less than 10,000 people;
- (b) The Regional Water Board has evaluated all waters of the U.S. that receive a discharge from the system;
- (c) The Regional Water Board has determined that storm water BMPs are not needed based on WLAs that are part of a U.S. EPA approved or established TMDL that addresses the pollutant(s) of concern or an equivalent analysis; and
- (d) The Regional Water Board has determined that future discharges from the Regulated Small MS4 do not have the potential to result in exceedances of water quality standards.

(3) Option 3 (applicable to Small MS4s outside an Urbanized Area only)

Small Disadvantaged Community – The Regulated Small MS4 certifies that it is a community with a population of 20,000 or less with an annual median household income (MHI) that is less than 80 percent of the statewide annual MHI. (Wat. Code, § 79505.5 , subd.(a)).

If the Waiver Certification Application Requirements or conditions of any waiver option are not met by the Regulated Small MS4, then the Regulated Small MS4 must submit a NOI via SMARTS and appropriate fee for coverage under this General Permit or apply for an individual NPDES permit.

The State Water Board or a Regional Water Board can, at any time, require a previously waived Regulated Small MS4 to comply with this General Permit or an individual NPDES permit if circumstances change so that the conditions of the waiver are no longer met. Changed circumstances can also allow a Regulated Small MS4 to request a waiver at any time.

B. DISCHARGE PROHIBITIONS

1. Discharges of waste from the MS4 that are prohibited by Statewide Water Quality Control Plans or applicable Regional Water Quality Control Plans (Basin Plans) are prohibited.
2. Discharges of storm water from the MS4 to waters of the U.S. in a manner causing or threatening to cause a condition of pollution or nuisance as defined in Water Code § 13050 are prohibited.
3. Discharges through the MS4 of material other than storm water to waters of the U.S. shall be effectively prohibited, except as allowed under this Provision or as otherwise authorized by a separate NPDES permit. The following non-storm water discharges are not prohibited provided any pollutant discharges are identified and appropriate control measures to minimize the impacts of such discharges, are developed and implemented under the Permittee's storm water program. This provision does not obviate the need to obtain any other appropriate permits for such discharges.
 - a. water line flushing;
 - b. individual residential car washing;
 - c. diverted stream flows;
 - d. rising ground waters;
 - e. uncontaminated ground water infiltration (as defined at 40 C.F.R. §35.2005(20)) to separate storm sewers;
 - f. uncontaminated pumped ground water;
 - g. discharges from potable water sources;
 - h. foundation drains;
 - i. air conditioning condensation;
 - j. springs;
 - k. water from crawl space pumps;
 - l. footing drains;
 - m. flows from riparian habitats and wetlands;
 - n. dechlorinated swimming pool discharges; and
 - o. incidental runoff from landscaped areas(as defined and in accordance with Section B.4 of this Order).

Discharges or flows from fire-fighting activities are excluded from the effective prohibition against non-storm water and need only be addressed where they are identified as significant sources of pollutants to waters of the U.S.

If a Permittee or a Regional Water Board Executive Officer determines that any individual or class of non-storm water discharge(s) listed above may be a significant source of pollutants to waters of the U.S. or physically interconnected MS4, or poses a threat to water quality standards (beneficial uses), the Regional Water Board Executive Officer may require the appropriate Permittee to monitor and submit a report and to implement BMPs on the discharge.

4. Discharges in excess of an amount deemed to be incidental runoff shall be controlled. Regulated Small MS4s shall require parties responsible for such to implement Sections B.4.a-d below. Incidental runoff is defined as unintended amounts (volume) of runoff,

such as unintended, minimal over-spray from sprinklers that escapes the area of intended use. Water leaving an intended use area is not considered incidental if it is part of the facility design, if it is due to excessive application, if it is due to intentional overflow or application, or if it is due to negligence.

Parties responsible for controlling runoff in excess of incidental runoff shall:

- a. Detect leaks (for example, from broken sprinkler heads) and correct the leaks within 72 hours of learning of the leak;
- b. Properly design and aim sprinkler heads;
- c. Not irrigate during precipitation events; and
- d. Manage pond containing recycled water such that no discharge occurs unless the discharge is a result of a 25-year, 24-hour storm event or greater, and the appropriate Regional Water Board is notified by email no later than 24 hours after the discharge. The notification is to include identifying information, including the Permittee's name and permit identification number.

Non-storm water runoff discharge that is not incidental is prohibited, unless otherwise specified in Section B.3 above.

Incidental runoff may be regulated by waste discharge requirements or, where necessary, waste discharge requirements that serve as a NPDES permit, including MS4 permits.

5. Discharge to Areas of Special Biological Significance (ASBS) is prohibited except in compliance with the ASBS Special Protection Provisions in Attachment C. Regulated Small MS4s that discharge to an ASBS are listed in Attachment D and are subject to the ASBS Special Protection Provisions.

C. EFFLUENT LIMITATIONS

1. Permittees shall implement controls as required by this Order to reduce the discharge of pollutants from their MS4s to waters of the U. S. to the MEP. Permittees shall additionally reduce the discharge of pollutants (1) to achieve TMDL waste load allocations (WLAs) established for discharges by the MS4s and (2) to comply with the Special Protections for discharges to ASBS.
2. Storm water discharges regulated by this Order shall not contain a hazardous substance in amounts equal to or in excess of a reportable quantity listed in 40 C.F.R. Part 117 or 40 C.F.R. Part 302.

D. RECEIVING WATER LIMITATIONS

Discharges shall not cause or contribute to an exceedance of water quality standards contained in a Statewide Water Quality Control Plan, the California Toxics Rule (CTR), or in the applicable Regional Water Board Basin Plan.

The Permittee shall comply with Receiving Water Limitations through timely implementation of control measures/BMPs and other actions to reduce pollutants in the discharges and other requirements of this Order including any modifications. The storm water program shall be designed to achieve compliance with Receiving Water Limitations. If exceedance(s) of water quality objectives or water quality standards persist notwithstanding implementation of other storm water program requirements of this Order, the Permittee shall assure compliance with Receiving Water Limitations by complying with the following procedure:

1. Upon a determination by either the Permittee or the Regional Water Board that MS4 discharges are causing or contributing to an exceedance of an applicable water quality standard, the Permittee shall promptly notify and thereafter submit a report to the Regional Water Board that describes BMPs that are currently being implemented and additional BMPs that will be implemented to prevent or reduce any pollutants that are causing or contributing to the exceedance of water quality standards. The report shall include an implementation schedule. The Regional Board may require modifications to the report;
2. Submit any modifications to the report required by the Regional Water Board within 30 days of notification;
3. Implement the actions specified in the report in accordance with the approved schedule;
4. So long as the Permittee has complied with the procedure set forth above and is implementing the actions, the Permittee does not have to repeat the same procedure for continuing or recurring exceedances of the same receiving water limitations unless directed by the State Water Board or the Regional Water Board to develop additional BMPs.

E. PROVISIONS FOR ALL TRADITIONAL SMALL MS4 PERMITTEES

E.1. RENEWAL TRADITIONAL SMALL MS4 PERMITTEES

All Renewal Traditional Small MS4s Permittees shall comply with this Section. Where the requirements of a certain subsection provide a compliance date that is past the effective date of this Order, the Renewal Traditional Small MS4 shall implement its existing program until that date.

E.2. NEW TRADITIONAL SMALL MS4 PERMITTEES

New Traditional Small MS4s shall comply with this Section.

E.3. NON-TRADITIONAL SMALL MS4S PERMITTEES

E.3.a. All Renewal Non-Traditional Small MS4 Permittees shall comply with Section F of this Order. Where the requirements of a certain subsection provide a compliance date that is past the effective date of this Order, the Renewal Non-Traditional Small MS4 shall implement its existing program until that date.

E.3.b. New Non-Traditional Small MS4s Permittees shall comply with Section F of this Order.

E.4. SMALL MS4 ASBS PERMITTEES

Both Traditional and Non-traditional Small MS4s Permittees that discharge to ASBS as listed on Attachment D shall comply with Attachment C in addition to all other applicable provisions of this Order.

E.5. SEPARATE IMPLEMENTING ENTITY (SIE)

Permittees, both Traditional and Non-traditional Small MS4s, may rely on a SIE to satisfy one or more of the permit obligations, if the SIE can appropriately and adequately address the storm water issues of the Permittee. The SIE must agree to implement the BMPs, or components thereof, to achieve compliance with this Order. If the SIE fails to implement the BMPs, the Permittee remains responsible for compliance with this Order.

E.6. PROGRAM MANAGEMENT ELEMENT

To effectively implement a coordinated storm water program, the Permittee shall have an overarching Program Management element in its storm water management program. The Program Management element shall include the following:

E.6.a. Legal Authority

- (i) **Task Description** – Within the second year of the effective date of the permit, the Permittee shall review and revise relevant ordinances or other regulatory mechanisms, or adopt any new ordinances or other regulatory mechanisms, to obtain adequate legal authority, to the extent allowable under state or local law, to control pollutant discharges into and from, as applicable, its MS4, and to meet the requirements of this Order.
- (ii) **Implementation Level** –At a minimum, the Permittee shall have adequate legal authority to:
 - (a) Effectively prohibit non-storm water discharges through the MS4. Exceptions to this prohibition are NPDES-permitted discharges of non-storm water and non-storm water discharges in B.3 that are considered non-significant contributors of pollutants. Where the non-storm water discharge is to a segment of an MS4 that discharges directly to an ASBS, exceptions to the non-storm water prohibition are specified in Attachment C.

- (b) Detect and eliminate illicit discharges and illegal connections to the MS4. Illicit connections include pipes, drains, open channels, or other conveyances that have the potential to allow an illicit discharge to enter the MS4. Illicit discharges include all non-storm water discharges not otherwise authorized in this Order, including discharges from organized car washes, mobile cleaning and pressure wash operations,
- (c) Respond to the discharge of spills, and prohibit dumping or disposal of materials other than storm water into the MS4.
- (d) Require parties responsible for runoff in excess of incidental runoff to implement Discharge Prohibition B.4.a-e.
- (e) Require operators of construction sites, new or redeveloped land; and industrial and commercial facilities to minimize the discharge of pollutants to the MS4 through the installation, implementation, or maintenance of BMPs consistent with the California Storm Water Quality Association (CASQA) Best Management Practice Handbooks or equivalent.
- (f) Require information deemed necessary to assess compliance with this Order. The Permittee shall only require information in compliance with the Homeland Security Act or any other federal law that concerns security in the United States. The Permittee shall also have the authority to review designs and proposals for new development and redevelopment to determine whether adequate BMPs will be installed, implemented, and maintained during construction and after final stabilization (post-construction).
- (g) Enter private property for the purpose of inspecting, at reasonable times, any facilities, equipment, practices, or operations for active or potential storm water discharges, or non-compliance with local ordinances/standards or requirements in this Order, as consistent with any applicable state and federal laws.
- (h) Require that dischargers promptly cease and desist discharging and/or cleanup and abate a discharge, including the ability to:
 - 1) Effectively require the discharger to abate and clean up their discharge, spill, or pollutant release within 72 hours of notification; high risk spill should be cleaned up as soon as possible.
 - 2) Require abatement within 30 days of notification, for uncontrolled sources of pollutants that could pose an environmental threat;
 - 3) Perform the clean-up and abatement work and bill the responsible party, if necessary;
 - 4) Provide the option to order the cessation of activities until such problems are adequately addressed if a situation persists where pollutant-causing sources or activities are not abated;
 - 5) Require a new timeframe and notify the appropriate Regional Water Board when all parties agree that clean-up activities cannot be completed within the original timeframe and notify the appropriate Regional Water Board in writing within five business days of the determination that the timeframe requires revision.
- (i) When warranted, have the ability to:
 - 1) Levy citations or administrative fines against responsible parties either immediately at the site, or within a few days.

- 2) Require recovery and remediation costs from responsible parties.
- (j) Impose more substantial civil or criminal sanctions (including referral to a city or district attorney) and escalate corrective response, consistent with its Enforcement Response Plan developed pursuant to Section E.6.c., for persistent non-compliance, repeat or escalating violations, or incidents of major environmental harm.

E.6.b. Certification

- (i) **Task Description** – Within the second year of the effective date of the permit, the Permittee shall certify by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative as described in 40 Code of Federal Regulations section 122.22(b) that the Permittee has and will maintain full legal authority to implement and enforce each of the requirements contained in this Order.
- (ii) **Implementation Level** – The Permittee's certification statement shall include the following:
 - (a) Identification of all departments within the Permittee's jurisdiction that conduct storm water-related activities and their roles and responsibilities under this Order.
 - (b) Citation of storm water runoff related ordinances, identification of the topics each ordinance addresses;
 - (c) Identification of the local administrative and legal procedures and ordinances available to mandate compliance with storm water-related ordinances and therefore with the conditions of this Order.
 - (d) A description of how storm water related-ordinances are reviewed and implemented.
 - (e) A statement that the municipality will implement enforcement actions consistent with its Enforcement Response Plan developed pursuant to Section E.6.c.
- (iii) **Reporting** – All Permittees shall submit in the second year online Annual Report, a statement signed by an authorized signatory certifying the Permittee has adequate legal authority to comply with all Order requirements.

E.6.c. Enforcement Measures and Tracking

- (i) **Task Description** – Within the third year of the effective date of the permit, the Permittee shall develop and implement an Enforcement Response Plan. The Enforcement Response Plan shall contain enforcement procedures and actions and identify the Permittee's responses to violations and describe how the Permittee will address repeat and continuing violations by implementing progressively stricter responses as needed to achieve compliance.
- (ii) **Implementation Level** - The Enforcement Response Plan shall describe how the Permittee will use each of the following types of enforcement responses based on the type of violation:
 - (a) **Verbal Warnings** – Verbal warnings are primarily consultative in nature. At a minimum, verbal warnings shall specify the nature of the violation and required corrective action.

- (b) Written Notices – Written notices shall include nature of the violation and the required corrective action, with deadlines for taking such action.
- (c) Escalated Enforcement Measures – The Permittee shall establish legal authority to employ any combination of the enforcement actions below (or their functional equivalent), and to escalate enforcement responses where necessary to correct persistent non-compliance, repeat or escalating violations, or incidents of major environmental harm:
 - 1) Citations (with Fines) – The Enforcement Response Plan shall describe when the Permittee will assess monetary fines, which may include civil and administrative penalties.
 - 2) Stop Work Orders – The Enforcement Response Plan shall describe when the Permittee will issue stop work orders that require construction activities to be halted, except for those activities directed at cleaning up, abating discharge, and installing appropriate BMPs.
 - 3) Withholding of Plan Approvals or Other Authorizations – Where a facility is in non-compliance, the Enforcement Response Plan shall describe how the Permittee’s own approval or authorization processes that affect the facility’s ability to discharge to the MS4 can be used to abate the violation.
 - 4) Additional Measures – The Enforcement Response Plan may also describe other escalated measures the Permittee has under its local legal authorities. For example, the Permittee may need to improve erosion control measures and collect the funds to pay for work and materials from the responsible party by either collecting against the project’s bond or directly billing the responsible party.
- (d) NPDES Permit Referrals–For those construction projects or industrial facilities subject to the State’s Construction General Permit (CGP) or Industrial General Permit (IGP), the Permittee shall:
 - 1) Refer non-filers (i.e., those facilities that cannot demonstrate that they obtained permit coverage) to the appropriate Regional Water Board within 30 days of making that determination, or file a complaint on the State Water Board’s website:
http://www.dtsc.ca.gov/database/CalEPA_Complaint/index.cfm. In making such referrals, at a minimum include the following documentation:
 - a) Construction project or industrial facility location.
 - b) Name of owner or operator.
 - c) Estimated construction project size or type of industrial activity (including the Standard Industrial or the North American Industry Classification, if known).
 - d) Records of communication with the owner or operator regarding filing requirements.
 - 2) Refer ongoing violations to the appropriate Regional Water Board provided that the Permittee has made a good faith effort of progressive enforcement to achieve compliance with its own ordinances. At a minimum, the Permittee’s good faith effort shall include documentation

of two follow-up inspections and two warning letters or notices of violation. In making such referrals, the Permittee shall include, at a minimum, the following information:

- a) Construction project or industrial facility location
- b) Name of owner or operator
- c) Estimated construction project size or type of industrial activity (including Standard Industrial Classification or North American Industry Classification System if known)
- d) Records of communication with the owner or operator regarding the violation, including at least two follow-up inspections, two warning letters or notices of violation, and any response from the owner or operator
- e) Enforcement Tracking –Track instances of non-compliance via hard-copy files or electronically. The enforcement tracking documentation shall include, at a minimum, the following:
 - (1) Name of owner/operator
 - (2) Location of construction project or industrial facility
 - (3) Description of violation
 - (4) Required schedule for returning to compliance
 - (5) Description of enforcement response used, including escalated responses if repeat violations occur or violations are not resolved within the time specified in the enforcement action.
 - (6) Accompanying documentation of enforcement response (e.g., notices of noncompliance, notices of violations, etc.)
 - (7) Any referrals to different departments or agencies
- f) Recidivism Reduction – The Permittee shall identify chronic violators of any provision of this Order or of any related local ordinance or regulation and reduce the rate of noncompliance recidivism. The Permittee shall develop incentives, disincentives, or increase inspection frequency at the operator's sites to prevent chronic violations.

(iii) **Reporting** – The Permittee shall use State Water Board SMARTS to submit a summary of the past year activities and certify compliance with all requirements of this program element. The summary shall also address the relationship between the program element activities and the Permittee's Program Effectiveness Assessment and Improvement Plan that tracks annual and long-term effectiveness of the storm water program. If a Permittee is unable to certify compliance with a requirement in this program element see Section E.16.a.for compliance directions.

E.7. EDUCATION AND OUTREACH PROGRAM

Traditional Small MS4 Permittees may be required to implement Community-Based Social Marketing (CBSM) requirements as detailed in Attachment E upon determination by a Regional Board Executive Officer. The Regional Board Executive Officer shall notify Permittees within

three months of the permit adoption date of their determination to require CBSM.⁹ The notification shall include a statement of reasons why the Executive Officer finds that implementation of CBSM is appropriate. If the Permittee disagrees with the Executive Officer determination, the Permittee may bring the dispute to the State Water Board Executive Director or his designee as specified under the Dispute Resolution provision of this Order.

E.7.a. Public Education and Outreach

Within the first year of the effective date of the permit, all Permittees shall comply with the requirements in this Section by selecting one or more of the following Public Education and Outreach options:

- 1) Contributing to a countywide storm water program, as determined appropriate by the Permittee members, so that the countywide storm water program conducts outreach and education on behalf of its members; or
- 2) Contributing to a regional outreach and education collaborative effort (a regional outreach and education collaborative effort occurs when all or a majority of the Permittees collaborate to conduct regional outreach and education. Regional outreach and education collaboration includes Permittees defining a uniform and consistent message, deciding how best to communicate the message, and how to facilitate behavioral changes, then collaboratively apply what is learned through local jurisdiction groups, pooling resources and skills.); or
- 3) Fulfilling outreach and education requirements within their jurisdictional boundaries on their own; or
- 4) A combination of the previous options, so that all requirements are fulfilled.

Reporting – By the first year Annual Report, the Permittee shall submit information indicating which Public Education and Outreach option(s) it will use to comply with this Section. For each option involving a contribution to a countywide storm water program or regional outreach and education collaborative effort, the Permittee shall complete and have available in the first year Annual Report documentation, such as a written agreement, letter or similar document, which confirms the collaboration with other MS4s.

- (i) **Task Description** – Within the second year of the effective date of the permit, the Permittee shall develop and implement a comprehensive storm water public education and outreach program. The public education and outreach program shall be designed to reduce pollutant discharges in storm water runoff and non-storm water discharges to the MS4 through increased storm water knowledge and awareness in target communities. The Public Education and Outreach Program shall be designed to measurably increase the knowledge and awareness of targeted audience regarding the municipal storm drain system, impacts of urban runoff and non-storm water discharges on receiving waters, and potential BMP solutions for the target audiences, thereby reducing pollutant releases to the MS4 and the environment.

⁹ Getting in Step, A Guide to, Conducting Watershed Outreach Campaigns, 3rd Edition, November 2010, EPA 841-B-10-002, USEPA, Office of Water.

(ii) **Implementation Level** –The Permittee shall, at a minimum:

- (a) Develop and implement a public education strategy that establishes education tasks based on water quality problems, target audiences, and anticipated task effectiveness. The strategy must include identification of who is responsible for implementing specific tasks and a schedule for task implementation. The strategy must demonstrate how specific high priority storm water quality issues in the community or local pollutants of concern are addressed.
- (b) Implement surveys at least twice during the permit term to gauge the level of awareness in target audiences and effectiveness of education tasks.
- (c) Develop and convey a specific storm water message that focuses on the following:
 - 1) Local pollutants of concern
 - 2) Target audience
 - 3) Regional water quality issues
- (d) Develop and disseminate appropriate educational materials to target audiences and translate into applicable languages when appropriate (e.g. the materials can utilize various media such as printed materials, billboard and mass transit advertisements, signage at select locations, stenciling at storm drain inlets, radio advertisements, television advertisements, and websites);
- (e) Utilize public input (e.g., the opportunity for public comment, or public meetings) in the development of the program;
- (f) Distribute the educational materials, using whichever methods and procedures determined appropriate during development of the public education strategy;
- (g) Convey messages to explain the benefits of water-efficient and storm water-friendly landscaping¹⁰, using existing information if available;
- (h) Develop and convey messages specific to reducing illicit discharges with information about how the public can report incidents to the appropriate authorities. The Permittee must promote, publicize, and facilitate public reporting of illicit discharges or water quality impacts associated with discharges into or from MS4s through a central contact point, including phone numbers for complaints and spill reporting, and publicize to both internal Permittee staff and the public. If 911 is selected, the Permittee must also create, maintain, and publicize a staffed, nonemergency phone number with voicemail, which is checked daily;
- (i) Develop and convey messages specific to proper application of pesticides, herbicides, and fertilizers;
- (j) Within the Permittee's jurisdiction, provide independent, parochial, and public schools with materials to effectively educate school –age children about storm water runoff and how they can help protect water quality habitat in their local watershed (s). The Permittee is encouraged to use environmental and place-based, experiential learning materials that are integrated into school curricula and school facility management¹¹. In the case that an environmental and place-

¹⁰ For example, Surfrider's Ocean Friendly Garden Program (<http://www.surfrider.org/programs/entry/ocean-friendly-gardens>) and the Water Efficient Landscape Ordinance (WELO)

¹¹ For example, Splash (www.sacsplash.org/), Effie Yeaw Nature Center (www.sacnature.net) or Yolo Basin (www.yolobasin.org)

based, experiential learning local program does not exist, the Permittee may use California's Education and Environment Initiative Curriculum¹² or equivalent.

- (k) Develop (or coordinate with existing, effective programs) and convey messages specific to reducing discharges from organized car washes, mobile cleaning and pressure washing operations, and landscape irrigation.
 - (l) Conduct storm water-friendly education for organized car wash participants and provide information pertaining to car wash discharge reduction. The Permittee may use the Sacramento Stormwater Quality Partnership's River Friendly Carwash Program¹³, or equivalent, for guidance.
 - (m) Develop and convey messages specific to mobile cleaning and pressure wash businesses.
- (iii) **Reporting** – The Permittee shall use State Water Board SMARTS to submit a summary of the past year activities and certify compliance with all requirements of this program element. The summary shall also address the relationship between the program element activities and the Permittee's Program Effectiveness Assessment and Improvement Plan that tracks annual and long-term effectiveness of the storm water program. If a Permittee is unable to certify compliance with a requirement in this program element see Section E.16.a.for compliance directions.

E.7.b. Staff and Site Operator Training and Education

E.7.b.1. Illicit Discharge Detection and Elimination Training

- (i) **Task Description** – Within the third year of the effective date of the permit, the Permittee shall develop and implement a training program for all Permittee staff who, as part of their normal job responsibilities, may be notified of, come into contact with, or otherwise observe an illicit discharge or illegal connection to the storm drain system.
- (ii) **Implementation Level** – The training program shall include at a minimum:
 - (a) Identification of an illicit discharge or illegal connection.
 - (b) Proper procedures for reporting and responding to the illicit discharge or illegal connection.
 - (c) Follow-up training shall be provided as needed to address changes in procedures, techniques, or staffing.
 - (d) An annual assessment of their trained staff's knowledge of illicit discharge response and refresher training as needed.
 - (e) Training for new staff who, as part of their normal job responsibilities may be notified of, come into contact with, or otherwise observe an illicit discharge or illegal connection shall be trained no later than six months after the start of employment.
 - (f) Contact information, including the procedure for reporting an illicit discharge, shall be included in each of the Permittee's fleet vehicles that are used by field staff.
 - (g) Focused education on identified illicit discharges and associated illicit discharge locations.

¹² <http://www.californiaeei.org/>

¹³ <http://www.beriverfriendly.net/riverfriendlycarwashing/>

- (iii) **Reporting** – The Permittee shall use State Water Board SMARTS to submit a summary of the past year activities and certify compliance with all requirements of this program element. The summary shall also address the relationship between the program element activities and the Permittee's Program Effectiveness Assessment and Improvement Plan that tracks annual and long-term effectiveness of the storm water program. If a Permittee is unable to certify compliance with a requirement in this program element see Section E.16.a.for compliance directions.

E.7.b.2. Construction Outreach and Education

(a) Permittee Staff Training

- (i) **Task Description** – Within the second year of the effective date of the permit, the Permittee shall ensure that all staff implementing the construction site storm water runoff control program are adequately trained.
- (ii) **Implementation Level** – The Permittee may conduct in-house training or contract with consultants. Training shall be provided to the following staff positions of the MS4:
 - (a) Plan Reviewers and Permitting Staff - The Permittee shall ensure plan reviewers and permitting staff are qualified individuals, knowledgeable in the technical review of local erosion and sediment control plans, (including proper control measure selection, installation, implementation, and maintenance, as well as administrative requirements such as inspection reporting/tracking and the use of the Permittee's enforcement responses), and are certified pursuant to a State Water Board sponsored program as a Qualified Storm Water Pollution Prevention Plan (SWPPP) Developer (QSD), or a designated person on staff possesses the QSD credential.
 - (b) Erosion Sediment Control/Storm Water Inspectors - The Permittee shall ensure inspectors are qualified individuals, knowledgeable in inspection procedures, and are certified pursuant to a State Water Board sponsored program as either (1) a Qualified SWPPP Developer (QSD); (2) a Qualified SWPPP Practitioner (QSP); or (3) a designated person on staff possesses each credential (QSD to supervise plan review, QSP to supervise inspection operations).
 - (c) Third-Party Plan Reviewers, Permitting Staff, and Inspectors - If the Permittee utilizes outside parties to review plans and/or conduct inspections, the Permittee shall ensure these staff are trained.
- (iii) **Reporting** – The Permittee shall use State Water Board SMARTS to submit a summary of the past year activities and certify compliance with all requirements of this program element. The summary shall also address the relationship between the program element activities and the Permittee's Program Effectiveness Assessment and Improvement Plan that tracks annual and long-term effectiveness of the storm water program. If a Permittee is unable to certify compliance with a requirement in this program element see Section E.16.a.for compliance directions.

(b) Construction Site Operator Education

- (i) **Task Description** – Within the third year of the effective date of the permit, the Permittee shall develop and distribute educational materials to construction site operators.
- (ii) **Implementation Level** – The Permittee shall do the following:
 - (a) Each year, provide information on training opportunities for construction operators on BMP selection, installation, implementation, and maintenance as well as overall program compliance.
 - (b) Develop or utilize existing outreach tools (i.e. brochures, posters, etc.) aimed at educating construction operators on appropriate selection, installation, implementation, and maintenance of storm water BMPs, as well as overall program compliance.
 - (c) Distribute appropriate outreach materials to all construction operators who will be disturbing land within the MS4 boundary. The Permittee's contact information and website shall be included in these materials.
 - (d) Update the existing storm water website, as necessary, to include information on appropriate selection, installation, implementation, and maintenance of BMPs.
- (iii) **Reporting** – The Permittee shall use State Water Board SMARTS to submit a summary of the past year activities and certify compliance with all requirements of this program element. The summary shall also address the relationship between the program element activities and the Permittee's Program Effectiveness Assessment and Improvement Plan that tracks annual and long-term effectiveness of the storm water program. If a Permittee is unable to certify compliance with a requirement in this program element see Section E.16.a. for compliance directions.

E.7.b.3. Pollution Prevention and Good Housekeeping Staff Training

The Permittee shall train employees on how to incorporate pollution prevention/good housekeeping techniques into Permittee operations.

- (i) **Task Description** – Within the second year of the effective date of the permit, the Permittee shall develop a biennial employee training program for appropriate employees involved in implementing pollution prevention and good housekeeping practices as specified in Section E.11. Pollution Prevention/Good Housekeeping for Permittee Operations of this Order. The Permittee shall determine the need for interim training during alternate years when training is not conducted, through an evaluation of employee Pollution Prevention/Good Housekeeping knowledge. All new hires whose jobs include implementation of pollution prevention and good housekeeping practices must receive this training within the first year of their hire date.
- (ii) **Implementation Level** – The training program shall include the following:
 - (a) Biennial training for all employees implementing this program element. This biennial training shall include a general storm water education component, any new technologies, operations, or responsibilities that arise during the year, and the permit requirements that apply to the staff being trained. Employees shall

receive clear guidance on appropriate storm water BMPs to use at municipal facilities and during typical O&M activities.

- (b) A biennial assessment of trained staff's knowledge of pollution prevention and good housekeeping and shall revise the training as needed.
- (c) A requirement that any contractors hired by the Permittee to perform O&M activities shall be contractually required to comply with all of the storm water BMPs, good housekeeping practices, and standard operating procedures described above.
- (d) The Permittee shall provide oversight of contractor activities to ensure that contractors are using appropriate BMPs, good housekeeping practices and following standard operating procedures.
- (iii) **Reporting** – The Permittee shall use State Water Board SMARTS to submit a summary of the past year activities and certify compliance with all requirements of this program element. The summary shall also address the relationship between the program element activities and the Permittee's Program Effectiveness Assessment and Improvement Plan that tracks annual and long-term effectiveness of the storm water program. If a Permittee is unable to certify compliance with a requirement in this program element see Section E.16.a. for compliance directions.

E.8. PUBLIC INVOLVEMENT AND PARTICIPATION PROGRAM

- (i) **Task Description** – Within the second year of the effective date of the permit, the Permittee shall involve the public in the development and implementation of activities related to the program. The public participation and involvement program shall encourage volunteerism, public comment and input on policy, and activism in the community. The Permittee shall also be involved in their Integrated Regional Water Management Plan (IRWMP) or other watershed-level planning effort, if applicable.
- (ii) **Implementation Level** – At a minimum, the Permittee shall:
 - (a) Develop a public involvement and participation strategy that establishes who is responsible for specific tasks and goals.
 - (b) Consider development of a citizen advisory group (either a stand-alone group or utilize an existing group or process). The advisory group may consist of a balanced representation of all affected parties, including residents, business owners, and environmental organizations in the MS4 service area and/or affected watershed. The Permittee may invite the citizen advisory group to participate in the development and implementation of all parts of the community's storm water program.
 - (c) Create opportunities for citizens to participate in the implementation of BMPs through sponsoring activities (e.g., stream/beach/lake clean-ups, storm drain stenciling, volunteer monitoring and educational activities).
 - (d) Ensure the public can easily find information about the Permittee's storm water program.
 - (e) Actively engage in the Permittee's IRWMP or other watershed-level planning effort.

- (iii) **Reporting** – The Permittee shall use State Water Board SMARTS to submit a summary of the past year activities and certify compliance with all requirements of this program element. The summary shall also address the relationship between the program element activities and the Permittee's Program Effectiveness Assessment and Improvement Plan that tracks annual and long-term effectiveness of the storm water program. If a Permittee is unable to certify compliance with a requirement in this program element see Section E.16.a for compliance directions.

E.9. ILLICIT DISCHARGE DETECTION AND ELIMINATION

The Permittee shall develop an Illicit Discharge Detection and Elimination program to detect, investigate, and eliminate illicit discharges, including illegal dumping, into its system, to the extent allowable under law.¹⁴ The Permittee may utilize the CWP's guide on Illicit Discharge Detection and Elimination as guidance.

E.9.a. Outfall Mapping

- (i) **Task Description** – Within the second year of the effective date of the permit, the Permittee shall create and maintain an up-to-date and accurate outfall map¹⁵. The map may be in hard copy and/or electronic form or within a geographic information system (GIS) the development of the outfall map shall include a visual outfall inventory involving a site visit to each outfall. Renewal Permittees that have an existing up-to-date outfall map that includes the minimum requirements specified in Section E.9.a.(ii)(a-e) are not required to re-create the outfall map. This does not exempt Renewal Permittees with an existing outfall map from conducting the field sampling specified in Section E.9.c.
- (ii) **Implementation Level** - The outfall map shall at a minimum show:
 - (a) The location of all outfalls¹⁶ that are operated by the Permittee within the urbanized area, drainage areas, and land use(s) contributing to those outfalls that are operated by the Permittee, and that discharge within the Permittee's jurisdiction to a receiving water. Each mapped outfall shall be located using coordinates obtained from a global positioning system (GPS) and given an individual alphanumeric identifier, which shall be noted on the map. Photographs or an electronic database shall be utilized to provide baseline information and track operation and maintenance needs over time.
 - (b) The location (and name, where known to the Permittee) of all water bodies receiving direct discharges from those outfall pipes.
 - (c) Priority areas, including, but not limited to the following:

¹⁴ The Permittee shall use the Center for Watershed Protection's guide on Illicit Discharge Detection and Elimination (IDDE): A Guidance Manual for Program Development and Technical Assistance (available at www.cwp.org) or equivalent when developing an IDDE program. Guidance can also be found at: <http://cfpub.epa.gov/npdes/stormwater/idde.cfm>.

¹⁵ The Permittee may utilize existing forms such as the CWP Outfall Reconnaissance Inventory/Sample Collection Field Sheet while conducting the mapping inventory and Field Sampling as specified below, in Section E.9.c. (<http://cfpub.epa.gov/npdes/stormwater/idde.cfm>).

¹⁶ Submerged outfalls or other outfalls that may pose a threat to public safety and/or that are inaccessible are not required to be inventoried.

- 1) Areas with older infrastructure that are more likely to have illegal connections and a history of sewer overflows or cross-connections
- 2) Industrial, commercial, or mixed use areas;
- 3) Areas with a history of past illicit discharges;
- 4) Areas with a history of illegal dumping;
- 5) Areas with onsite sewage disposal systems;
- 6) Areas upstream of sensitive water bodies;
- 7) Areas that drain to outfalls greater than 36 inches that directly discharge to the ocean; and
- 8) Other areas that are likely to have illicit discharges

The priority area list shall be updated annually.

(d) Field sampling stations

(e) The permit boundary

Submerged outfalls or other outfalls that may pose a threat to public safety and/or that are inaccessible are not required to be inventoried.

- (iii) **Reporting** – The Permittee shall use State Water Board SMARTS to submit a summary of the past year activities and certify compliance with all requirements of this program element. The summary shall also address the relationship between the program element activities and the Permittee's Program Effectiveness Assessment and Improvement Plan that tracks annual and long-term effectiveness of the storm water program. If a Permittee is unable to certify compliance with a requirement in this program element see Section E.16.a.for compliance directions.

E.9.b. Illicit Discharge Source/Facility Inventory

- (i) **Task Description** – Within the second year of the effective date of the permit, the Permittee shall maintain an inventory of all industrial/commercial facilities/sources within the Permittee's jurisdiction (regardless of ownership) that could discharge pollutants in storm water to the MS4. The Permittee shall utilize the inventory to identify facilities for inspections of potential illicit discharges.
- (ii) **Implementation Level** - The inventory shall include the following:
- (a) Minimum information for each industrial facility/source:
 - Facility name;
 - Address;
 - Nature of business or activity;
 - Physical location (decimal latitude-longitude) of storm drain receiving discharge;
 - Name of receiving water and if the facility/source is tributary to a Clean Water Act Section 303(d) listed water body segment or water body segment subject to a TMDL;
 - Incorporation of facility information into GIS is optional.

- (b) At a minimum, the following industrial and commercial facilities/sources shall be included in the inventory.
- Vehicle salvage yards
 - Metal and other recycled materials collection facilities
 - Waste transfer facilities
 - Vehicle mechanical repair, maintenance or cleaning
 - Building trade central facilities or yards
 - Corporation yards
 - Landscape nurseries and greenhouses
 - Building material retailers and storage
 - Plastic manufacturers
 - Other facilities designated by the Permittees or Regional Water Boards to have reasonable potential to contribute to pollution of storm water runoff
- (c) The Permittee shall determine if the facilities that are required to be covered under the Statewide Industrial General Permit have done so. Upon discovering any facilities requiring permit coverage but are not yet permitted, the Permittee shall notify the appropriate Regional Water Board, and include copies of the notification in the online Annual Report.
- (d) The Permittee shall update the inventory annually. The update shall be accomplished through collection of new information obtained during inspections and contacts with commercial and industrial facility operators and owners, or through other readily available intra-agency informational databases (e.g., business licenses, pretreatment permits, sanitary sewer hook-up permits, and SMARTS database).
- (e) The Permittee shall develop and implement procedures to proactively identify illicit discharges originating from priority areas identified in Section E.9.a.(ii).(c). The Permittee shall implement the procedures to assess priority areas for the presence of illicit discharges at least once over the length of the permit term. The procedures shall include field observations, field screening, inspections, and any other appropriate and effective survey methods. Alternatively, Permittees may establish a self--certification program where Permittees require reports from authorized parties demonstrating the prevention and elimination of illicit discharges at their facilities in priority areas at least once over the length of the permit term.
- (iii) **Reporting** – The Permittee shall use State Water Board SMARTS to submit a summary of the past year activities and certify compliance with all requirements of this program element. The summary shall also address the relationship between the program element activities and the Permittee's Program Effectiveness Assessment and Improvement Plan that tracks annual and long-term effectiveness of the storm water program. If a Permittee is unable to certify compliance with a requirement in this program element see Section E.16.a.for compliance directions.

E.9.c. Field Sampling to Detect Illicit Discharges

- (i) **Task Description** – Within the second year of the effective date of the permit (e.g. while conducting the outfall inventory under Section E.9.a.), the Permittee shall sample

any outfalls that are flowing or ponding more than 72 hours after the last rain event. The Permittee shall also conduct dry weather sampling (more than 72 hours since the last rain event) of outfalls annually identified as priority areas.

(ii) **Implementation Level** – The Permittee shall:

- (a) Conduct monitoring¹⁷ for the following indicator parameters identified in Table 1 to help determine the source of the discharge. Alternatively, the Permittee may select parameters based on local knowledge of pollutants of concern in lieu of sampling for the parameters listed in Table 1. Modifications and associated justifications shall be identified within SMARTS prior to conducting field sampling as specified in Section E.9.c.(i).

Table 1. Indicator Parameters

Indicator Parameters Used to Detect Illicit Discharges					
Parameter	Discharge Types It Can Detect				Laboratory/Analytical Challenges
	Sewage	Washwater	Tap Water	Industrial or Commercial Liquid Wastes	
Ammonia	●	⊙	○	⊙	Can change into other nitrogen forms as the flow travels to the outfall
Color	⊙	⊙	○	⊙	
Conductivity	⊙	⊙	○	⊙	Ineffective in saline waters
Detergents – Surfactants	●	●	○	⊙	Reagent is a hazardous waste
Fluoride*	○	○	●	⊙	Reagent is a hazardous waste Exception for communities that do not fluoridate their tap water
Hardness	⊙	⊙	⊙	⊙	
pH	○	⊙	○	⊙	
Potassium	⊙	○	○	●	May need to use two separate analytical techniques, depending on the concentration
Turbidity	⊙	⊙	○	⊙	
<p>● Can almost always (>80% of samples) distinguish this discharge from clean flow types (e.g., tap water or natural water). For tap water, can distinguish from natural water.</p> <p>⊙ Can sometimes (>50% of samples) distinguish this discharge from clean flow types depending on regional characteristics, or can be helpful in combination with another parameter</p> <p>○ Poor indicator. Cannot reliably detect illicit discharges, or cannot detect tap water</p> <p>N/A: Data are not available to assess the utility of this parameter for this purpose.</p> <p>Data sources: Pitt (</p> <p>*Fluoride is a poor indicator when used as a single parameter, but when combined with additional parameters (such as detergents, ammonia and potassium), it can almost always distinguish between sewage and wash water.</p>					

¹⁷ A description of indicator parameter sampling equipment is described in Chapter 12: Indicator Monitoring in the CWP IDDE: Guidance Manual found at: http://www.epa.gov/npdes/pubs/idde_manualwithappendices.pdf. Sampling may be conducted using field test kits.

- (b) Verify that indicator parameters, as specified in Table 2. Action Level Concentrations for Indicator Parameters are not exceeded. Alternatively, the Permittee may tailor Table 2 to align with parameters based on local knowledge of pollutants of concern. Modifications and associated justifications shall be identified within SMARTS prior to conducting field sampling as specified in Section E.9.c.(i).

Table 2. Action Level Concentrations for Indicator Parameters

Indicator Parameter	Action Level Concentration
Ammonia	≥ 50 mg/L
Color	≥ 500 units
Conductivity	$\geq 2,000$ μ S/cm
Hardness	≤ 10 mg/L as CaCO ₃ or $\geq 2,000$ mg/L as CaCO ₃
pH	≤ 5 or ≥ 9
Potassium	≥ 20 mg/L
Turbidity	$\geq 1,000$ NTU

- (c) Conduct follow up investigations per Section E.9.d. if the action level concentrations are exceeded.
- (iii) **Reporting** – The Permittee shall use State Water Board SMARTS to submit a summary of the past year activities and certify compliance with all requirements of this program element. The summary shall also address the relationship between the program element activities and the Permittee's Program Effectiveness Assessment and Improvement Plan that tracks annual and long-term effectiveness of the storm water program. If a Permittee is unable to certify compliance with a requirement in this program element see Section E.16.a. for compliance directions.

E.9.d. Illicit Discharge Detection and Elimination Source Investigations and Corrective Actions

- (i) **Task Description** – Within the second year of the effective date of the permit, the Permittee shall develop written procedures for conducting investigations into the source of all non-storm water discharges suspected to be illicit discharges, including approaches to requiring such discharges to be eliminated, and procedures to implement corrective actions (e.g., BMPs). These procedures shall be included as part of the Illicit Discharge Detection and Elimination program. The Permittee may leverage existing inspection procedures and personnel to conduct illicit discharge detection and elimination source investigations and corrective actions.
- (ii) **Implementation Level** - At a minimum, the Permittee shall conduct an investigation(s) to identify and locate the source of any suspected illicit discharge within 72 hours of becoming aware of the suspected illicit discharge. For investigations that require more than 72 hours, the Permittee shall identify the actions being taken to identify and locate the source of the suspected illicit discharge.